



# **ALAGAPPA UNIVERSITY**

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(A State University Established by the Government of Tamil Nadu)

**KARAIKUDI – 630 003**



## **Directorate of Distance Education**

### **B.A. (Economics)**

**V - Semester**

**136 53**

## **AGRICULTURAL ECONOMICS**

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E-28, Sector-8, Noida - 201301 (UP)

Phone: 0120-4078900 • Fax: 0120-4078999

Regd. Office: A-27, 2nd Floor, Mohan Co-operative Industrial Estate, New Delhi 1100 44

• Website: [www.vikaspublishing.com](http://www.vikaspublishing.com) • Email: [helpline@vikaspublishing.com](mailto:helpline@vikaspublishing.com)

**Work Order No. AU/DDE/DE12-27/Preparation and Printing of Course Materials/2020 Dated 12.08.2020 Copies -**

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## Agricultural Economics

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**Unit-12:** Role of FCI, State Agencies - Price Expectation and Price Uncertainties, Price Stabilization.

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## INTRODUCTION

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### NOTES

Agricultural economics is the study of economic principles, with an emphasis on their application to the solution of the farm, agri-business, and agricultural industry problems in relationship to the other sectors. In other words, it is a branch of economics that applies economic principles to issues of agricultural production, natural resources and rural development. It largely focusses on optimizing the production and distribution of food and fibre. Earlier, the focus was limited to maximizing crop yield while maintaining a good soil ecosystem, but the current scope of the discipline includes areas such as agricultural environment and resources; prices and income; risk and uncertainty; market structures, finance, factors of production and much more.

The significance of the field of agricultural economics can be judged by its contributions to the disciplines of environmental economics, econometrics and developmental economics. And the policymakers need special knowledge of the subject as agricultural economics influences policies related to environment, agriculture and food.

Studying agricultural economics is becoming very important in India as the agricultural sector is one of the most significant parts of our economy. Agriculture is the only means of living for almost two-thirds of the employed class in India. The agricultural sector of India has occupied almost 43 per cent of India's geographical area. Agriculture is still the only largest contributor to India's GDP even after a decline in the same in the agriculture share of India. Agriculture also plays a significant role in the growth of socio-economic sector in India.

This book, *Agricultural Economics*, is written with the distance learning student in mind. It is presented in a user-friendly format using a clear, lucid language. Each unit contains an Introduction and a list of Objectives to prepare the student for what to expect in the text. At the end of each unit are a Summary and a list of Key Words, to aid in recollection of concepts learnt. All units contain Self Assessment Questions and Exercises, and strategically placed Check Your Progress questions so the student can keep track of what has been discussed.

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**BLOCK - I**  
**INTRODUCTION OF AGRICULTURAL ECONOMICS**

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*Overview of Agricultural  
Economics*

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**UNIT 1    OVERVIEW OF  
AGRICULTURAL  
ECONOMICS**

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**NOTES**

**Structure**

- 1.0 Introduction
- 1.1 Objectives
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**1.0    INTRODUCTION**

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Economics is a field of study which deals with the judicious use of resources. Agriculture as a field, deals with the production of resources for consumption. The application of economic principles in the field of agriculture is an important science every nation needs to adopt today not only to enhance their production values but to also improve their efficiency. In this unit, you will learn about the concept of agricultural economics; its nature, scope and importance along with the significance of why there is a need for a separate study of agricultural economics. In addition, you will also get to study about the linkage of agricultural sector with other sectors of the Indian economy.

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**1.1    OBJECTIVES**

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After going through this unit, you will be able to:

- Examine the nature and scope of agricultural economics
- Identify the need to study the field of agricultural economics
- Discuss the linkage of agriculture with the other sectors of the Indian economy

## NOTES

## 1.2 AGRICULTURAL ECONOMICS: DEFINITION

The word 'agriculture' is derived from the Latin words *agre*, meaning soil, and *cultura*, meaning its cultivation. **Agriculture** can be defined as the production and cultivation of crops, edible plants, or animals and animal products. The term is synonymous with farming, and involves the production of food and other organic materials. **Economics** can be defined as the science of analysis of the production, distribution and consumption of goods and services.

According to leading economist, Professor A. W. Gray (Department of Agricultural Economics, Purdue University, West Lafayette, Indiana, USA), agricultural economics may be defined as 'the science in which the principles and methods of economics are applied to the special conditions of agricultural industry'.

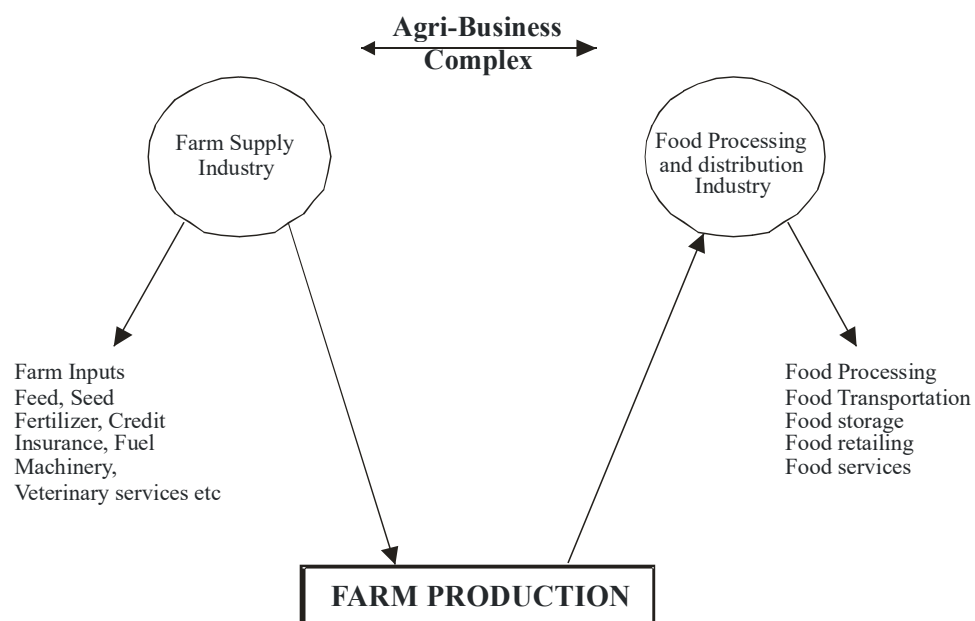
Well-known economist, Prof. Benjamin H. Hibbard, the distinguished professor of agricultural economics at the University of Wisconsin, US, defined agricultural economics as 'the study of relationship arising from the wealth-getting and wealth-using activity of man in agriculture'. However, agricultural economics should include within its purview not only subjects directly connected with the exploitation of land but also those which indirectly influence the economic activity on the farm and the well-being of the farm population.

Agricultural economics can be defined as the study of processing and distribution of agricultural output and consumption of grains, fruits, flowers and animals. It deals with the allocation of resources that are limited in supply for multiple uses in production, processing, distribution and consumption. It involves the application of the principles of economics to the production of crops and animals. It also involves determining the pattern of land usage and maximizing the yield of crops. At the same time, the production process should not harm the soil's ecosystem.

### 1.2.1 Scope, Nature and Importance of Agricultural Economics

Over the years, the scope of agricultural economics has rapidly expanded and the current scope of the discipline is much broader. Agricultural economics includes various applied areas with substantial overlapping with concepts of standard economics. Agricultural economics establishes a relationship between cause and effect and demand and supply, using the production function and various programming models. It applies various theories of economics, mathematics and statistics to the issues that plague agriculture and agribusiness.





**Fig. 1.1** Scope of Agricultural Economics

The importance of this field of study lies in the fact that agricultural depression in the 19th and 20th centuries attracted increased attention and concern regarding the causes and solutions of the world's agricultural problems.

Agriculture is an integral part of the world food system that has a fundamental link with crops and animal production system. Agricultural economists have to play a major role in understanding the intricacies involved in the foundation systems. The students of agricultural economics should have a clear insight and understanding of the influence of climatic conditions in determining as to how the commodities are produced and marketed in line with the consumption needs.

Agricultural economics demands in-depth knowledge of problems pertaining to production, finance marketing and government policies, and their impact on production and distribution is very essential to find out suitable solutions for the farm problems. It helps a farmer to make the following decisions:

- Kind of food to be produced
- Nature of crop to be raised in order to maximize profits
- Price point of the produce

The main problems faced by the agricultural sector can be grouped under three main heads:

- (i) Production
- (ii) Marketing
- (iii) Financing

## NOTES

## NOTES

Thus, agricultural economics is concerned with the forces that affect the prices of the agricultural products a farmer buys and sells, or in other words, the relation between agriculture and the rest of the economy. An important role of agricultural economists is to formulate methods, techniques and procedures by which the problems of agriculture may be tackled. This perhaps is the most difficult function which the agricultural economist is called upon to perform. Hence, according to well-known economists, G.W. Forster and MC. Leager, agricultural economics is 'an applied science and as such, is concerned with the identification, description and classification of the economic problems of agriculture, to the end that these problems may be solved'.

The problem of allocation of scarce resources for diverse uses is perhaps more crucial in the field of agriculture than in the economy as a whole for the simple reason that land, the basis of all agricultural pursuits, is highly limited in supply. The theoretical frame of agricultural economics has, therefore, to be more rigorous and thoughtful so as to provide a framework of effective methods and procedures which can help utilize the agricultural resources to the maximum satisfaction of the society. Agricultural economics is, therefore, both theoretical and applied in its character. The theory of agricultural economics deals with the development of principles of resource economics, and as an applied science, it deals with the application of these principles in diverse productive activities related to agriculture.

All the tools of analysis used in general economics are employed in agricultural economics as well. Some important branches of agricultural economics are economics of production, consumption, distribution, marketing, financing, planning and policy making as in case of general economics. A study at the micro and macro level for the agricultural sector is also made. Static and dynamic analysis is also relevant for the agricultural sector of the economy.

In other words, agricultural economics examines how a farmer chooses various enterprises, e.g., production of crops or raising of cattle, and how he chooses various activities in the same enterprise, e.g., which crop to grow and which crop to drop; how the costs are to be minimized; what combination of inputs for an activity are to be selected; what amount of each crop is to be produced; what type of commercial relations the farmers should have with people from whom they purchase their inputs or to whom they sell their products.

Instability of agriculture and agricultural unemployment are the problems which have to be dealt with, mainly at the macro level. Besides, there are the general problems of agricultural growth and problems like those concerning tenurial systems and tenurial arrangements, research and extension services, which are again predominantly macro in character. Such issues, with a focus on their origin, their impact and their solutions, are the subject matter of agricultural economics.

Again, agricultural economics, as at present, does not confine itself to the principles concerning economizing of resources in agriculture only, whether at the

micro or macro level or, from the 'static or 'dynamic' point of view. The scope of agricultural economics is larger than 'mere economizing of resources'. As we know, the mutual dependence of various sectors of the economy is well established. Growth of one sector is necessary for the growth of the other sector.

As such, in agricultural economics, we also study, for example, how the development of agriculture helps the development of the other sectors of the economies; how can labour and capital flow into the non-agricultural sectors; and how agricultural development initiates and sustains the development of other sectors of the economy. What this implies is that agricultural economics not only develops principles concerning the optimum use of scarce resources in agriculture but also examines the principles regarding:

- (a) The outflow of scarce resources to other sectors of the economy
- (b) The flow of these resources from other sectors into the agricultural sector itself

### **Nature of Agricultural Economics**

Agricultural economics can be defined as the study of production, processing, distribution, and consumption of food and fibre. It is a social science that deals with the allocation of scarce resources among those competing alternative uses found in production, processing, distribution, and consumption of food and fibre. The subject and the scope of agricultural economics have been improved in several directions and fields, taking the appropriate tools of sciences, particularly mathematics and statistics.

Agricultural economics makes use of the principles of general economics. The first point to be noted with regard to the nature of agricultural economics is that, in general, it borrows most of its principles from its parent body of knowledge, i.e., the general economics. Even the main branches of agricultural economics are similar to those of general economics. But then a question arises: if the principles of general economics are no different from the agricultural economics, why is there a need for a separate study of agricultural economics? The answer lies in the fact that agricultural economics does not merely involve direct implications of principles to the field of agriculture. The principles of economics are too general in nature and the general theory of economics has been considered as an abstraction from reality.

Before this theory is applied to agriculture for the purpose of economic analysis, its principles have to be modified so that their postulates totally tally with the main features of the agricultural sector. A few examples make it clear. In economic theory, we study price formation under various structures, e.g., monopoly, perfect competition and oligopoly. Here, we shall almost be completely ignoring the study of price formation of agricultural produce under condition of oligopoly or monopolistic competition or monopoly.

### **NOTES**

## NOTES

As discussed above, some agricultural economists see agricultural economics as an applied science. **Applied science** involves the use of the principles of a pure science to a particular situation. In agricultural economics, general principles of economics are modified. Therefore, it can be concluded that agricultural economics should not be called as an applied science but as a specialized form of pure science. As such a science, it explains the cause and effect relationships between various economic variables operating in agriculture, which can be used for solving various problems affecting agriculture.

### Check Your Progress

1. Define agriculture.
2. Why should agricultural economics not be called an applied science?

## 1.3 NEED FOR A SEPARATE STUDY OF AGRICULTURAL ECONOMICS

Agricultural economics is not a different kind of economics; a separate set of economic principles and methodology which has relevance only to agriculture. The general framework of the economic theory is applicable to the business of agriculture just as much as to that of industry. The analysis of equilibrium of demand and supply, of value and price etc., is as valid in agriculture as in industry. Then, if the general economic principles are applicable to the agricultural sector, the question arises: why should we study agricultural economics separately?

True, the goals of production and the need for management decisions concerning the allocation of inputs are strikingly similar between agricultural and industrial production. However, there are substantial differences in the natural conditions under which production must be carried out and in the sociological background in the agricultural sector which demands a separate study of agricultural economics.

Firstly, agriculture is a unique industry in which the mode of life and business enterprise is combined together. This combination no longer exists in the present-day industry. It is on this score that it is more influenced by sociological, political and sentimental considerations.

Secondly, another characteristic of agricultural production which distinguishes it from industrial production is that the farmer produces chiefly for his own needs. There is no denying the fact that in modern farming, the element of self-sufficiency has been reduced in importance but by no means has it been removed. In most underdeveloped countries, even today, farming is done on the basis of self-sufficiency.

Thirdly, many agricultural commodities are joint products like wheat and *affals* or mutton and wool because they are both part of the same plant or the same animal. The costs attributable to the various products cannot be separated

as they often can be in industry even when several products are produced in the same plant. Thus, in agriculture, it is rarely justifiable to consider the supply of any product in isolation.

Fourthly, agriculture requires a far larger proportion of land in relation to its employment of other factors than does industry. This is responsible for an early tendency of law of diminishing returns, wide scatter of production and the great importance of system of land tenure.

Fifthly, farming mostly is undertaken in small sized units and thereby gives little scope for division of labour. Thus, large scale organization and its benefits, typical of industry, is less applicable to agriculture.

Sixthly, unlike in the manufacturing industry, combinations are not possible in farming due to the existence of a large number of small farm holdings. This results in acute competition among farmers.

Finally, in agriculture, farmers' control over production is very limited. When production is either not controlled or not controllable, serious maladjustments are likely to occur because at times more products will be produced than are required and could be sold profitably and at other times, not enough products are available when prices are high.

## NOTES

### 1.4 AGRICULTURAL LINKAGES WITH OTHER SECTORS

The Indian economy witnessed a structural change over the years from a primary agro-based economy during the 1970s to service sector which predominant the economy. This structural change and uneven pattern of sectoral growth brought forth a substantial change in production and demand linkage in the Indian economy. The WTO reforms and the integration to the global economy have changed the landscape of the Indian agriculture sector. Thus, the importance of agriculture and its sustainable development could not be belittled as India is committed to achieving Sustainable Development Goals (SDGs). The process of economic development relies on a strong backward and forward linkage between agriculture and other sectors in the economy.

Therefore, the parallel growth of the agricultural sector and its linkage to other sectors in the economy should not be seen in isolation.

#### The Nature of Linkage

The agriculture linkage with different sectors of the economy can be classified as the following:

- **Backward linkage:** This refers to the relationship between industry and the suppliers of its inputs. A change in the output of an industry is transmitted back to the suppliers of its inputs by change in demand for inputs.

- **Forward linkage:** This refers to the relationship between an industry and other industries which use output as an input. A change in output or price transmitted forwards to the industry/user of produce.

## NOTES

### Agriculture Linkage to Different Sectors

1. **Primary Sector:** The primary sector of the economy relies on basic food and material which are extracted from the earth. The activities related to the primary sector include agriculture, mining, forestry, grazing, fishing, and quarrying. The packaging and food processing are also part of this sector.
2. **The Secondary Sector:** This sector is dependent on the primary sector because finished goods are produced from raw material which is extracted by the primary sector. The activities such as automobile production, textile production, metalworking and smelting, the chemical and engineering industries, energy utilities, aerospace manufacturing, breweries and bottlers, construction, and shipbuilding come under this sector.
3. **Tertiary Sector:** The tertiary sector relies on the secondary sector and also known as the service sector. This sector sells goods which are extracted by the primary sector and transformed to finished goods by the secondary sector. This sector renders its services to both the general population and to the businesses. The activities like retail and wholesale sales, restaurants, transportation and distribution, media, tourism, clerical services, insurance, health care, banking and law are part of this sector.
4. **Quaternary Sector:** Most of the economic models divide an economy only in three sectors but some divide it in four or even five. This sector is closely linked with the tertiary sector and includes fields such as government, libraries, culture, scientific research, education and information technology. The research and innovation conducted by such activities brings productivity to agriculture. This sector invents new agriculture technology to boost growth and optimum utilization of scarce resources.
5. **Other linkages and contribution:**
  - a. **Agricultural contribution to industrial growth:** Industrialization is founded on the principle of substantial growth and could be restricted due to failure to expand food supplies. Agriculture provides product and making food and raw material available to the industry. If food supplies fail to expand with the growth in demand this could result in a substantial rise in food prices which further put pressure upon wage rate with consequent adverse effects on industrial profits, investment and growth. On the other hand, the agriculture sector comprises the vast majority of unskilled and semi-skilled people which will be utilized as a workforce by the industry. But industry supplies industrial inputs such as pesticides, fertilizers, machinery etc., to agriculture. Therefore, industry and agriculture are dependent and interlinked.

- b. Source of Capital formation and Foreign Exchange:** Emerging countries rely on their lion share of national income which is generated by the agricultural sector. If the agriculture sector is well developed and connected then it can make a net contribution to capital formation. This argument is supported by the fact that the capital-output ratio in agriculture is relatively low compared to another sector. Therefore, there is a great scope of raising agriculture productivity because it requires a reasonable outlay of capital. The agricultural produce is in the form of primary products and its export bring foreign capital.
- c. Market demand:** Agricultural workforce and the people dependent on agricultural activities are the consumers of industrial product demand which forms a major chunk of market demand which drives growth in the manufacturing and allied sectors.
- d. Bank Finance:** The changing environment and government policies persuade the banking sector to lend more to the agriculture sector. Further, banks are also indulging in training and setting up consultancies for the agricultural community so that financial inclusion of agriculture-based society and marketing their produce could be possible. In a country like India where agriculture is highly depended on monsoon, the role of the banking sector from lending to consultation becomes all the more crucial.
- e. Energy Sector:** The agricultural produce such as *guar* has become India's most valuable commodity as this crop is used by American companies to extract shale gas. American drilling companies spent more than \$2.5 billion in 2011 and by 2012 guar production doubled in India and at one time became a most valuable exporting commodity. The farmers in Rajasthan, Andhra Pradesh, Karnataka, Haryana, Punjab are rich in producing and exporting *guar* for shale gas extraction. This has given a shift to Indian agriculture from traditional to consumer-driven agriculture.

The biofuel demand is growing across the world as countries are switching from fossil fuels to more environment-friendly fuels such as biofuels and renewable energy. Ethanol production increased remarkably as government achieved a target of ethanol blending with petrol of 2 per cent in the year 2017. Further, the government is trying to achieve an ethanol production target of 20 per cent blend in petrol by 2030. This initiative will give impetus to Indian agriculture and bring down the energy import bill for India.

The role of agriculture in climate change, energy security and sustainable development will pave the way for future opportunity in research and agriculture technological advancement and will further lead to better utilization of agricultural residue which goes unprocessed especially in a country like India.

## NOTES

## NOTES

### Check Your Progress

3. What are the activities related to the primary sector of the Indian economy?
4. What does the quaternary sector denote?

## 1.5 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Agriculture can be defined as the production and cultivation of crops, edible plants, or animals and animal products.
2. Some agricultural economists see agricultural economics as an applied science. Applied science involves the use of the principles of a pure science to a particular situation. In agricultural economics, general principles of economics are modified. Therefore, it can be concluded that agricultural economics should not be called as an applied science but as a specialized form of pure science. As such a science, it explains the cause and effect relationships between various economic variables operating in agriculture, which can be used for solving various problems affecting agriculture.
3. The primary sector of the economy relies on basic food and material which are extracted from the earth. The activities related to the primary sector include agriculture, mining, forestry, grazing, fishing, and quarrying. The packaging and food processing are also part of this sector.
4. The quaternary sector is often known as the knowledge-based part of the economy, which includes knowledge-oriented economic sectors such as information technology, research and development, consultation, education, financial planning, blogging, and designing.

## 1.6 SUMMARY

- Agriculture can be defined as the production and cultivation of crops, edible plants, or animals and animal products. The term is synonymous with farming, and involves the production of food and other organic materials. Economics can be defined as the science of analysis of the production, distribution and consumption of goods and services.
- Agricultural economics can be defined as the study of processing and distribution of agricultural output and consumption of grains, fruits, flowers and animals. It deals with the allocation of resources that are limited in supply for multiple uses in production, processing, distribution and consumption.



- The importance of this field of study lies in the fact that agricultural depression in the 19th and 20th centuries attracted increased attention and concern regarding the causes and solutions of the world's agricultural problems.
- The problem of allocation of scarce resources for diverse uses is perhaps more crucial in the field of agriculture than in the economy as a whole for the simple reason that land, the basis of all agricultural pursuits, is highly limited in supply.
- Instability of agriculture and agricultural unemployment are the problems which have to be dealt with, mainly at the macro level.
- Agricultural economics can be defined as the study of production, processing, distribution, and consumption of food and fibre. It is a social science that deals with the allocation of scarce resources among those competing alternative uses found in production, processing, distribution, and consumption of food and fibre.
- Agricultural economics is not a different kind of economics; a separate set of economic principles and methodology which has relevance only to agriculture. The general framework of the economic theory is applicable to the business of agriculture just as much as to that of industry.
- The Indian economy witnessed a structural change over the years from a primary agro-based economy during the 1970s to service sector which predominant the economy.
- Emerging countries rely on their lion share of national income which is generated by the agricultural sector. If the agriculture sector is well developed and connected, then it can make a net contribution to capital formation.

## NOTES

### 1.7 KEY WORDS

- **Economics:** It can be defined as the science of analysis of the production, distribution and consumption of goods and services.
- **Agricultural economics:** It can be defined as the study of processing and distribution of agricultural output and consumption of grains, fruits, flowers and animals.
- **Oligopoly:** It is the market condition that exists when there are few sellers, as a result of which they can greatly influence price and other market factors.

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## 1.8 SELF ASSESSMENT QUESTIONS AND EXERCISES

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### NOTES

#### Short-Answer Questions

1. Define the term 'agricultural economics' in your own words.
2. Write a short note on the scope and nature of agricultural economics.

#### Long-Answer Questions

1. Analyse the significance of agricultural economics as a separate field to be studied by economists.
2. Discuss the linkage of agriculture with the other sectors of the Indian economy.

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## 1.9 FURTHER READINGS

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Hanumantha Rao, C.H. 1965. *Agricultural Production Function, Costs and Returns in India*. Mumbai: Tata McGraw Hill.

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## UNIT 2 AGRICULTURE AND ECONOMIC DEVELOPMENT

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*Agriculture and  
Economic Development*

### NOTES

#### Structure

- 2.0 Introduction
- 2.1 Objectives
- 2.2 Role of Agriculture Development
- 2.3 Declining Importance of Agriculture in Economic Development
- 2.4 Answers to Check Your Progress Questions
- 2.5 Summary
- 2.6 Key Words
- 2.7 Self Assessment Questions and Exercises
- 2.8 Further Readings

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### 2.0 INTRODUCTION

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Agriculture is the primary source of livelihood for almost 58 per cent of the Indian population. The Indian food industry is poised for huge growth, increasing its contribution to world food trade every year due to its immense potential for value addition, particularly within the food processing industry. During 2019-20 crop year, foodgrain production was estimated to reach a record 295.67 million tonnes (MT). In 2020-21, Government of India is targeting food grain production of 298 MT.

In this unit, you will study about the role of agriculture development and declining importance of agriculture in economic development.

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### 2.1 OBJECTIVES

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After going through this unit, you will be able to:

- Examine the role of agriculture development
- Discuss the declining importance of agriculture in economic development

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### 2.2 ROLE OF AGRICULTURE DEVELOPMENT

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Food production plays a vital role in the agricultural sector in almost all countries of the world. The income of the farmers increases when output expands with increased productivity. Substantial demand for food increases with the growth in per capital income.

## NOTES

In the least developed countries (LDCs), for example, the income elasticity of demand (responsiveness of the demand for a good to a change in the income of the people demanding the good) for food is very high, ranging between 0.6 and 0.8 per cent. Moreover, the demand for food also increases due to:

- (i) High growth rate of population
- (ii) Rapid fall in the mortality rates
- (iii) Reduction in fertility rates

The increase of population in towns and industrial areas also results in the increase in demand for food. All these factors highlight that the output of farm production should be higher than the demand for food. However, if the production of agricultural products is less than the demand, it results in substantial increase in food prices. Nevertheless, food may be imported in order to prevent domestic shortage and increase in prices; however, this can be at the cost of capital goods which are important for development. Measures like rationing, compulsory food collection and control of prices can also be introduced. All these factors highlight the significance of increase in food production in LDCs.

Increase in agricultural surplus strengthens the rural purchasing power, which further plays a vital role in industrial development. In an underdeveloped economy, the market for manufactured goods is very small. This is because of the low purchasing power of the population, which usually comprises of peasants, farm labourers and their families, who occupy two-thirds or four-fifths of the population. The low productivity in agriculture further emphasizes the lack of real purchasing power. Therefore, the small size of the market is mainly responsible for low-investment returns.

Expansion of agricultural output and productivity will result in the increase of rural purchasing power. This would further stimulate the demand for manufactured goods, increase the size of the market and also result in the expansion of the industrial sector. Moreover, the means of transport and communication will increase as it would transport the surplus agricultural products to urban areas and the manufactured goods to the rural areas. Whether operated in the public or the private sector, the effects of expansion of the secondary and the tertiary sector in the long run will incur higher profits. The rate of capital formation would further increase due to these profits, which would be utilized for reinvestment. According to Simon Smith Kuznets, a Russian American economist, when agriculture trades with others, it is called 'market contribution'.

Generally, underdeveloped countries focus on producing less agricultural products for exports. Export of such goods increases with the expansion of output and productivity of the exportable products, which further results in the increase of foreign exchange earnings. Agricultural surplus therefore, results in capital formation in the form of foreign exchange, which is used to import capital goods.

As industrialization results in more economic development, the proportion to agricultural exports in the country's total exports is expected to fall as the agricultural products for export are required in significant quantities for domestic production of goods to avoid imports. These products are substitutes of import and help in preserving foreign exchange.

Net savings of foreign exchange can also be gained when there is an increased marketed surplus of foodgrains. The goal of the economy is to achieve self-sufficiency in the production of food. Foreign exchange can also be conserved and earned when the production of food and export crops increases, which further leads to the development of others sectors of the economy. Foreign exchange earnings can not only help improve the efficiency of other industries but also set up new industries by importing raw materials, state-of-the-art machines, technical expertise and capital equipment, which are in short supply. Kuznets calls this as 'product contribution' of agriculture, which increases the growth of net output per capita output of the economy.

Significant amount of capital is required by an underdeveloped country for constructing and expanding its infrastructure, and also for improving and promoting the basic and heavy industries. In the initial stages of development, capital can be arranged by augmenting the marketable surplus of agricultural products from the rural sector. However, this should not affect the consumption level of the rural population. In their book, *The Role of Agriculture in Economic Development*, Bruce F. Johnston and John W. Mellor, said, 'An increase in agricultural productivity implies some combination of reduced inputs, reduced agricultural prices or increased farm receipts'.

An important source of capital formation can be labour when it is utilized more in construction work than for agricultural production. However, this possibility is limited as construction works require skilled labour and utilizing farm labours for this work would involve training them, which would require more time and capital. It is also not practical to increase capital formation by reducing agricultural prices when the increase in prices is unavoidable. Although, in future, the agricultural prices can be reduced but this policy yet this may not be followed by the democratic countries for political reasons. Therefore, a practical approach to this issue would be to stabilize the prices of agricultural products.

Another important source of capital formation can be to increase farm receipts, which can be done by mobilizing:

1. Increased farm incomes through agricultural taxation
2. Land taxes
3. Agricultural income tax
4. Land registration charges
5. School fees

## NOTES

6. Fee for providing agricultural technical services
7. Other types of fees that cover all or part of the cost of services provided to the farm population

## NOTES

Land revenue earnings are decreasing, while political reasons do not favour agricultural income tax. Therefore, some economists are of the view that in underdeveloped countries, the consequences of very less taxation of agriculture are:

1. An inactive farm sector
2. A financially-starved public sector
3. A slow rate of economic growth in the country

Therefore, in countries where agriculture plays a dominating role in the economy, agricultural taxation is important for increasing agricultural surplus which further helps in speeding up the economic development. This is referred to by Kuznets as 'factor contribution' in agriculture when resources are transferred to other sectors. These resources are called productive factors.

Agriculture also plays a vital role in increasing and expanding opportunities of employment in rural areas. Non-farm rural employment increases and diversifies with the increase in agricultural productivity and farm income. Marginal and landless farmers are mainly occupied with non-agricultural activities that satisfy local demand. These activities generally include the following:

- (i) Manufacture of tools, furniture, handicrafts, textiles, leather and metal working
- (ii) Construction of houses and other buildings
- (iii) Processing, marketing, transport and repair work
- (iv) Education, medicine and other services

Moreover, agricultural surplus, which results in the increase of rural incomes, also helps improve rural welfare. As a result of the increased incomes, farmers start consuming more nutritional food, such as milk, *ghee*, high quality cereals, fruits, etc., and also build better houses with modern amenities. They also improve their standards of living by purchasing advanced transport and communication facilities, and availing services like schools, health centres, irrigation and banking.

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## 2.3 DECLINING IMPORTANCE OF AGRICULTURE IN ECONOMIC DEVELOPMENT

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The agriculture transformation as a dominant sector especially in underdeveloped and emerging countries to a small sector in developed countries is a central characteristic of economic development. As the economic development proceeds, agricultural decline is left as a residue of such development. In India more than 50

per cent of the population who are dependent on agriculture are the most vulnerable to such a decline in the agriculture sector. Reforms and economic development in the past 20 years in India have brought down agricultural contribution to GDP to merely about 15 per cent. At present, agriculture is considered to be the least preferred employment opportunity in India. Despite increased crop cultivation since Independence, India is home to more than 25 per cent hungry people across the world. Hence, the question arises: Is Indian agriculture a paradox?

Many theories in the past have attempted to understand the inverse relationship between economic development and agricultural decline but the exact reason could not be comprehended. Therefore, to understand the phenomenon of economic development and agricultural decline, we have to classify the reasons and bring more understanding towards such factors:

- 1. Green Revolution:** The Green Revolution refers to a period when Indian agriculture drastically transformed due to the adoption of modern methods such as high yielding variety seeds, irrigation, tractors, pesticides and fertilizers. Many economists supported the Green Revolution and there is no denying to that because crop productivity increased by using hybrid seeds and use of pesticides and fertilizers. Thereafter, the seed industry opened its gates to the Multinational Companies (MNCs) like Bayer and Monsanto. These MNCs who came with the sole objective of earning profits sold a spurious variety of seeds to Indian farmers and genuine seeds are no longer available. Therefore, the genuine seed market collapsed and most of the farmers stopped buying them. The hybrid seed is given impetus to agricultural production in the short-run but it jeopardizes productivity in the long run. Further, excessive use of fertilizers and pesticides degrades the soil and groundwater quality in the long run. Moreover, farmers stopped the earlier technique of crop rotation and become more dependent on the hybrid seed. To corroborate this fact, BT cotton is the best example. Finally, the lack of education and access to modern farming techniques and technology led to the destruction of traditional farming and agriculture methods. Therefore, due to soil and irrigation vulnerability to Green Revolution techniques, agricultural development along with economic development was not sustainable.
- 2. Land Holding pattern:** India is a highly populated country and land is a limited resource for farming activity. The average landholding in India is less than the US and China. The Radha Krishna Committee report titled 'Report on Agriculture Indebtedness by Expert Group' reported that landholding is less than 10 per cent to top who hold close to 54 per cent of agricultural land. Further, 60 per cent of Indian farmers hold less than 0.4 hectares of land. This finding was published in the 'Survey of Indian Agriculture 2011', The Hindu Group. Land inequality among farmers reduces their productivity and earning per farmer.

## NOTES

## NOTES

**3. Road Transport and Industrial Development:** Land is also being largely used for the development of roadways and other industrial development activities. When industries are set up on fertile land, the land becomes useless for agriculture.

**4. Irrigation:** Agriculture in India by and large depends on groundwater, which contributes to 61 per cent to the total irrigation activity in India. Further, river and canal water system contributes to merely 29 per cent of total irrigation and the remaining is covered by monsoon rainfall from July to September months. The increased demand for irrigation puts pressure on groundwater resources which in turn leads to a decline in the water level. The cash crops like sugarcane and cotton consume more water but on the contrary, there is not much encouragement on conserving groundwater. The use of chemicals in fertilizers and pesticides is poisoning the water bodies as well. Therefore, it is required to use groundwater sensibly and overcome the water crisis by sustainable methods like rainwater harvesting that could recharge groundwater and drip irrigation techniques which may change the future of irrigation in India.

**5. Finance:** Credit facility to farmers has always been a challenge especially in underdeveloped and developing countries. Even today, farmers are the mercy of money lenders for obtaining credit wherein they end up paying heavy interest. At times, banks do not extend insurance facilities to farmers due to fear of non-payment of credit. Recently, loan waiver schemes have been launched by the government to alleviate the miseries of the farmers. Thus, you can say that agriculture has become a high risk but low productivity business.

**6. Post-harvest mechanism:** Once the harvesting of crops is done, the farmer has to find a market to sell. It is to be noted that market cartels and brokers are eating up the profits of the farmers as farmers are compelled to sell at a less price. Farmers do not have proper storage facilities; hence, they have to sell their harvest at whatever price they get from the middlemen.

A good supply chain management and food storage facilities need to be provided to the farmers so that they can procure good selling price for their harvest. Moreover, most of the farmers are uneducated and do not have enough information about the selling procedure of crops in our country. Hence, they have to rely on the market middlemen. The frequent price fluctuation and fight to retrieve at least maximum support price (MSP) always remains challenging for farmers in India.

Recently, the central government has come with laws in favour of farmers. The Farmers Produce Trade and Commerce (Promotion and Facilitation) Bill, 2020 permits farmers to sell their produce outside APMC mandis to whoever, even the end customer, offers a higher price. The Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Bill, 2020 allows farmers to enter into a contract farming agreement the buyer for procurement of crops at pre-approved prices. The Essential Commodities (Amendment) Bill, 2020



declassifies items like onions, cereals, pulses, potatoes, edible oilseeds and oils as essential items in normal circumstances. But the introduction of the bills and passing of the Act has met with a lot of protests by farmers across the nation and specially from Punjab and Haryana.

### **Check Your Progress**

1. List the factors responsible for high demand of food.
2. Mention the non-agricultural activities that satisfy local demand.

## **NOTES**

## **2.4 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS**

1. The factors responsible for high demand of food are the following:
  - (i) High growth rate of population
  - (ii) Rapid fall in the mortality rates
  - (iii) Reduction in fertility rates
2. The non-agricultural activities that satisfy local demand are the following:
  - (i) Manufacture of tools, furniture, handicrafts, textiles, leather and metal working
  - (ii) Construction of houses and other buildings
  - (iii) Processing, marketing, transport and repair work
  - (iv) Education, medicine and other services

## **2.5 SUMMARY**

- Food production plays a vital role in the agricultural sector in almost all countries of the world. The income of the farmers increases when output expands with increased productivity. Substantial demand for food increases with the growth in per capital income.
- The increase of population in towns and industrial areas also results in the increase in demand for food. All these factors highlight that the output of farm production should be higher than the demand for food.
- Increase in agricultural surplus strengthens the rural purchasing power, which further plays a vital role in industrial development. In an underdeveloped economy, the market for manufactured goods is very small.
- Expansion of agricultural output and productivity will result in the increase of rural purchasing power. This would further stimulate the demand for manufactured goods, increase the size of the market and also result in the expansion of the industrial sector.

## NOTES

- Significant amount of capital is required by an underdeveloped country for constructing and expanding its infrastructure, and also for improving and promoting the basic and heavy industries. In the initial stages of development, capital can be arranged by augmenting the marketable surplus of agricultural products from the rural sector.
- An important source of capital formation can be labour when it is utilized more in construction work than for agricultural production. However, this possibility is limited as construction works require skilled labour and utilizing farm labours for this work would involve training them, which would require more time and capital.
- Agriculture also plays a vital role in increasing and expanding opportunities of employment in rural areas. Non-farm rural employment increases and diversifies with the increase in agricultural productivity and farm income. Marginal and landless farmers are mainly occupied with non-agricultural activities that satisfy local demand.
- Many theories in the past have attempted to understand the inverse relationship between economic development and agricultural decline but the exact reason could not be comprehended.
- Credit facility to farmers has always been a challenge especially in underdeveloped and developing countries. Even today, farmers are the mercy of money lenders for obtaining credit wherein they end up paying heavy interest.
- A good supply chain management and food storage facilities need to be provided to the farmers so that they can procure good selling price for their harvest.

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## 2.6 KEY WORDS

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- **Least developed countries (LDCs):** These are low income countries suffering from lack of industrial growth and dependent on foreign aid.
- **Income elasticity of demand:** It implies responsiveness of the demand for a good to a change in the income of the people demanding the good.
- **Capital formation:** It is a term used to describe the net capital accumulation during an accounting period for a particular country.

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## 2.7 SELF ASSESSMENT QUESTIONS AND EXERCISES

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### Short-Answer Questions

1. What are the important source of capital formation can be to increase farm receipts?

2. How does agriculture contribute to the increase in employment opportunities in the rural sector?
3. Define the term 'market contribution'.

### **Long-Answer Questions**

1. 'Expansion of agricultural output and productivity will result in the increase of rural purchasing power.' Explain the statement.
2. Examine the phenomenon of economic development and agricultural decline.

### **NOTES**

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## **2.8 FURTHER READINGS**

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- Hanumantha Rao, C.H. 1965. *Agricultural Production Function, Costs and Returns in India*. Mumbai: Tata McGraw Hill.
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## UNIT 3 TRANSFORMING TRADITIONAL AGRICULTURE

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### Structure

- 3.0 Introduction
- 3.1 Objectives
- 3.2 Fei-Ranis Model
- 3.3 Schultz Model
- 3.4 Mellor Model
- 3.5 Answers to Check Your Progress Questions
- 3.6 Summary
- 3.7 Key Words
- 3.8 Self Assessment Questions and Exercises
- 3.9 Further Readings

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### 3.0 INTRODUCTION

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Agriculture is changing rapidly all over the world, leading to new approaches to agricultural development. This unit discusses the approaches of T.W. Schultz, John Mellor, John Fei and Gustav Ranis to agricultural development.

Fei-Ranis model highlights the movement of labour from agricultural to non-agricultural field. Schultz, the 1979 winner (jointly with William Arthur Lewis) of the Nobel Memorial Prize in Economic Sciences, in his theory advocates the use of science and technology for the transformation of traditional agriculture. On the other hand, Mellor, a leading rural economist of the world, suggests a number of methods, such as encouraging research in the field of agriculture, supply of modern inputs and development of communication system.

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### 3.1 OBJECTIVES

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After going through this unit, you will be able to:

- Examine the Ranis-Fei Model
- Analyse Schultz's suggestions for transforming traditional agriculture
- Discuss the three phases of agricultural development as propounded in the Mellor Model

## 3.2 FEI-RANIS MODEL

John Fei and Gustav Ranis model (commonly known as the Ranis-Fei Model) concentrates on the movement of labour from agricultural to non-agricultural field. This shift of labour is considered the main hindrance to economic development. In one of their articles titled 'A Theory of Economic Development,' John Fei and Gustav Ranis analyse the movement of an underdeveloped economy with regards to its transitional phase in which the underdeveloped economy moves from a stagnant phase to a phase of self-sustained growth. The Ranis-Fei theory is considered to be an advancement of the Unlimited Supplies of Labour theory proposed by Lewis. The Ranis-Fei theory is said to be a step-up from the Lewis theory as his theory is unable to give a reasonable distinction regarding the developments and progress in the field of agriculture. You will learn about the Lewis Model in Unit 4.

Ranis-Fei theory relates to an underdeveloped labour-surplus and resource-poor economy in which the vast majority of the population is engaged in agricultural activities irrespective of the prevalent unemployment coupled with an increase of population. The agrarian economy is mostly stagnant and the majority of the population is engaged in traditional agricultural pursuits. Non-agricultural pursuits exist but they are characterized by a modest use of capital. There is also an active and dynamic industrial sector. The contribution of surplus workers negligible and even zero at times and in order for development to take place, it is imperative to reallocate surplus workers in the agricultural sector to the industrial sector. Once these surplus workers are shifted to the industrial sector, they not only become productive but also wage equals in comparison to the institutional wage in the agricultural sector.

### Assumptions

In presenting their theory of economic development, Fei and Ranis make the following assumptions:

1. Population growth is taken as an exogenous phenomenon.
2. It is assumed that the marginal productivity of labour becomes zero at some point. If population exceeds the quantity at which the marginal productivity of labour becomes zero, labour can be transferred to the industrial sector without loss in agricultural output.
3. Agricultural activity is characterized by constant returns to scale with labour as a variable factor.
4. There is a dual economy divided into a traditional and stagnant agricultural sector and an active industrial sector.
5. There is no accumulation of capital in agriculture except in the form of land reclamation.

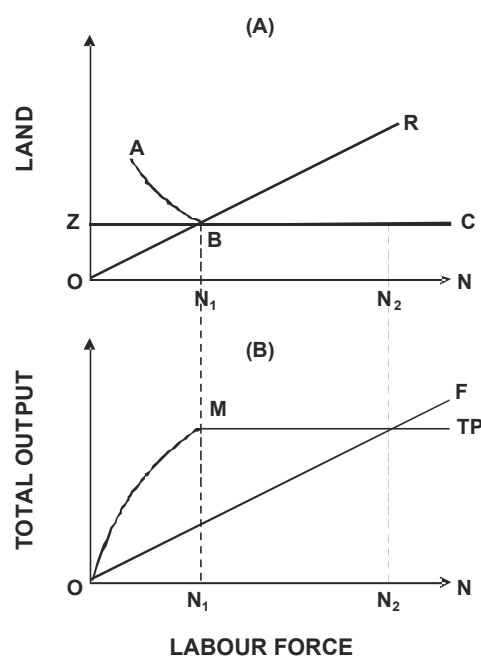
### NOTES

## NOTES

6. The output of the industrial sector is a function of capital and labour alone. Land has no role as a factor of production.
7. The output of the agricultural sector is a function of land and labour alone.
8. Land is fixed in supply.
9. The real wage in the industrial sector remains fixed and is equal to the initial level of real income in the agricultural sector. They call it the institutional wage.
10. Workers in either sector consume only agricultural products.

### The Working of the Model

Given these assumptions, 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 commercialized.

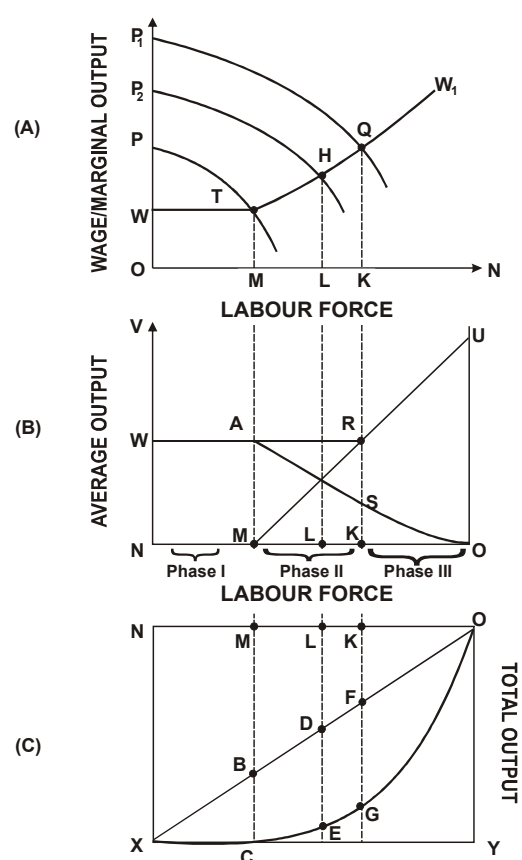


**Fig. 3.1** Ranis-Fei Model in the Agricultural Sector

Figure 3.1 shows the functioning of the agricultural sector where agricultural goods are produced by the application of labour (L) and land (Z). Labour is

measured on the horizontal axis and land on the vertical axis. The ray OR shows the stage of production. The curve ABC is the production contour of agricultural goods. Assuming land to be fixed at OZ, labour  $ON_1$  produces the maximum output. The total productivity of labour is represented by the TP curve output. The total productivity of labour is represented by the TP curve in Figure 3.1(B). If more labour is employed beyond  $N_1$  with land OZ, production would not increase. This is because the total productivity of labour force engaged in agriculture,  $ON_1$  is the non-redundant labour and  $N_1N_2$  is the redundant labour force.  $N_1N_2$  number of workers do not make any positive contribution to output and their marginal physical productivity approaches zero beyond point M on the TP curve.

Economic development takes place when these workers are shifted from the agricultural sector to the industrial sector in three phases. This is illustrated in Figure 3.2 where Panel (A) depicts the industrial sector and panels (B) and (C) the agricultural sector.



**Fig. 3.2** Economic Development when Workers are Shifted to Industrial Sector

Let us take Panel (C) where the labour force in the agricultural sector is measured from right to left on the horizontal axis ON and agricultural output downward from O on the vertical axis OY. The curve OCX is the total physical productivity curve (TPP) of the agricultural sector. The horizontal portion CX of

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the curve shows that the total productivity is constant in this region so that the marginal productivity of MN labour is zero. Thus MN labour is surplus and its withdrawal to the industrial sector will not affect agricultural output. If, however, it is presumed that the entire labour force ON is engaged in the agricultural sector, it produces NX total agricultural output. Assuming that the entire output N is consumed by the total labour force ON, the real wage is equal to  $NX/ON$  or the slope of the ray OX. This is the institutional wage.

The allocation process in three phases during the take-off is depicted in Panel (B) of the Figure 3.2 where the total labour force is measured from right to left on the horizontal axis ON and the average output on the vertical axis NV. The curve NMRU represents the marginal physical productivity of labour (MPP) in the agricultural sector. NW is the institutional wage at which the workers are employed in this sector.

In Phase I, NM workers are disguised unemployed. Their marginal physical productivity is zero, as shown by NM portion of the MPP curve in Panel (B) or CX portion of the TPP curve of Panel (C). This redundant labour force NM is transferred to the industrial sector shown as OM in Panel (A) at the one institutional wage OW (=NW).

In Phase II, the MPP of agricultural workers MK is positive in the range MR on the MPP curve NMRU but is less than the institutional wage KR(=NW) they get, as shown in Panel (B). So they are also disguised unemployed to some extent and are shifted to the industrial sector. But the nominal wage in this phase. This is because agricultural output declines with the transfer of labour to the industrial sector. As a result, there is a shortage of agricultural commodities leading to rise in their prices relative to industrial goods. This leads to the worsening of the terms for the industrial sector, thereby requiring a rise in the nominal wage in the industrial sector. The nominal wage rises above the institutional wage OW to LH and KQ. This is shown by the upward movement of the supply curve of labour from WT to H and Q, as ML and LK labour gradually shifts to the industrial sector in Panel (A). The movement on the supply curve of labour  $WTN_1$  from T upward is 'the Lewis turning point.'

When Phase III begins, agricultural workers start producing agricultural output equal to the institutional wage and ultimately more than the institutional wage they get. This marks the end of the take-off and the beginning of the self-sustained growth. This is shown by the rising portion U of the MPP curve in Panel (B) which is higher than the institutional wage KR (=NW). Consequently, KC of labour will be shifted from the agricultural sector to the industrial sector at a rising nominal wage above KQ in Panel (A) of the figure 3.2. This leads to the exhaustion of the surplus labour in the agricultural sector which becomes fully commercialized. According to Fei and Ranis, the exhaustion of the labour surpluses must be interpreted primarily as a market phenomenon rather than as a physical shortage of manpower, it is indicated by an increase in the teal wage at the source of supply.



Fei and Ranis point out that as agricultural workers are shifted to the industrial sector, there begins a surplus of agricultural commodities. This leads to the total agricultural surplus (or TAS) in the agricultural sector. The excess portion of total agricultural output over the consumption requirement of the agricultural output over the consumption requirement of the agricultural labour force at the institutional wage is the TAS. The amount of TAS is a function of the number of workers shifted to the industrial sector in each phase of the development process. The TAS is measured in Panel (C) or the figure by the vertical distance between the line OX and the TPP curve OCX. In Phase I when NM labour is transferred, the TAS is BC. In phase II, as ML and LK workers are shifted to the industrial sector, DE and FG amounts of TAS arise. 'TAS may be viewed as agricultural resources released to the market through the re-allocation of agricultural workers. Such resources can be siphoned off by means of the investment activities of the loan lord class and/or government tax policy and can be utilized in support of the new industrial arrivals.'

There is also the average agricultural surplus (or AAS). The AAS is the total agricultural surplus available per head to workers allocated to the industrial sector. It is as if each allocated workers carries his own subsistence bundle along with him. The AAS curve is depicted as WASO curve in Panel (B) of the figure. In Phase I, the AAS curve coincides with the institutional wage curve WA. In Phase II, when MK workers are transferred to the industrial sector, the AAS begins to fall from A to S in Panel (B) while TAS is still rising from BC to DE to FG in Panel (C).

In Phase III, AAS declines more rapidly from S to O in Panel (B) and TAS also declines as shown by the narrowing of the area from FG toward O in Panel (C) below Phase III of Panel (B). The decline in both AAS and TAS is due to the rise in the MPP of agricultural workers by more than the institutional wage which ultimately leads to the transfer of the remaining surplus labour to the industrial sector.

Fei and Ranis call the boundary between Phases I and II as the 'shortage point' when shortages of agricultural goods begin as indicated by the fall of the AAS (the portion AS of WASO curve) below the minimum institutional wage (NW) and the boundary between phase II and III as the 'commercialization point' which signifies the beginning of equality between MPP and the institutional wage in agriculture. Thus the Lewis turning point coincides with the shortage point of Fei and Ranis, and the increase in the industrial wage is speeded up at the commercialization point.

They show that if agricultural productivity is increasing, the shortage point and the commercialization point coincide. This is because with the increase in agricultural productivity the rise in MPP enables the output to rise to the level of the institutional wage more quickly. It may be viewed as the shifting of MRU curve upward to the left in Figure 3.2 (B). On the other hand, the AAS increases with the increase in total physical productivity. This means that the ASO curve in Figure 3.2 (B) shifts upward to the right. If the rise in productivity is sufficient, the MRU and ASO curves in Figure 3.2 (B) will so shift upward that the shortage point A

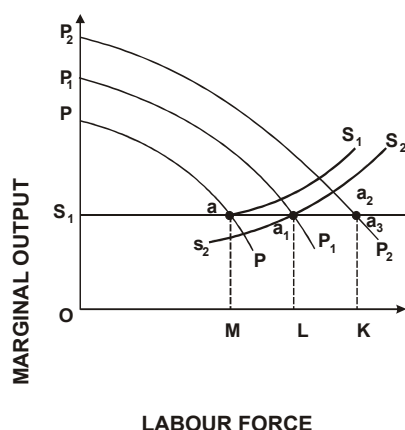
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and the commercialization point R coincide and Phase II is eliminated. So far as the industrial sector is concerned, the increase in agricultural productivity has the effect of raising the industrial supply curve after the turning point. This can be viewed as the shifting of the  $WTW_1$  curve downward to the right below point T in Figure 3.2 (A). As per the Ranis-Fei model, the equality between turning point and the commercialization point is economically significant as the industrial curve of labour finally rises once the agricultural sector is not dominated by non-market institutional forces however duplicates its features. In other words, the economic significance of the elimination of the second phase is that it enables the economy to move smoothly into self-sustained growth.

### Balanced Growth

Fei and Ranis have further shown that their model satisfies the conditions of balanced growth during the take-off process. Balanced growth requires simultaneous investment in both the agricultural and industrial sectors of the economy. This is illustrated in Figure 3.3 where  $PP$  is the initial demand curve for labour and  $S_1S_1$  the initial supply curve of labour. They intersect at  $a$  where  $OM$  labour force is employed in the industrial sector. At this level of employment, the industrial sector is getting a profit equal to the area  $S_1Pa$ . This profit is the total investment fund available to the economy during the take off process. A part of this fund is allocated to the agricultural sector thereby raising agricultural productivity and shifting the supply curve of labour in the industrial sector downward to the right from  $S_1S_1$  to  $S_2S_2$ . The remaining part of the investment fund is allocated to the industrial sector, thereby shifting the industrial demand curve upward to the right from  $PP$  to  $P_1P_1$ . The  $S_2S_2$  and  $P_1P_1$  curves intersect at  $a_1$  lying on the balanced growth path  $S_1a_3$ . At  $a_1$  the industrial sector absorbs  $ML$  labour force which has been released by the agricultural sector as a result of rise in agricultural productivity following the allocation of investment fund to it. In Figure 3.3,  $ML$  labour force absorbed in the industrial sector exactly equals the labour force  $ML$  released from the agricultural sector in Figure 3.2.



**Fig. 3.3** *ML Labour Force Absorbed in the Industrial Sector Exactly Equals the Labour Force ML Released from the Agricultural Sector*

Thus as investment funds are continues to be allocated to both sectors through time, the economy will move on the balanced-growth path. But there is every likelihood for the actual growth path to deviate from the balanced-growth path from time to time. 'Such a deviation, however, will call into play countervailing equilibrating forces which tend to bring it back to the balanced-growth path. The actual path is, in fact, likely to be oscillating around the balanced-growth path.' For example, if as a result of overinvestment in the industrial sector, the demand curve for labour shifts to  $P_2P_2$  and intersects the supply curve of labour  $S_2S_2$  at  $a_2$ , the actual growth path will be above the balanced-growth path. This will lead to a shortage of agricultural goods, to a deterioration of the terms of trade of the industrial sector and to a rise in the wage rate in this sector. This will discourage investment in the industrial sector and encourage investment in the agricultural sector and thereby bring the actual path to the level of the balanced-growth path  $a_3$ .

### A Critical Appraisal

The Fei-Ranis model shows the interaction between the two sectors in initiating and accelerating development. Moreover, its explanation of the Lewis turning point is more realistic. But the major merit of the theory is that it shows the importance of agricultural products in capital accumulation in underdeveloped countries.

Despite these merits, the model is not free from criticisms some which are discussed below.

1. **MPP not Zero:** Fei and Ranis observe that 'with a fixed amount of land, there will be some size of population which is large enough to render MPP zero.' But Schultz does not agree that in labour-surplus economies the MPP is zero. According to him, if it were so, the institutional wage would also be zero. The fact is that every worker receives a minimum wage, may be in kind, if not in cash. Thus it is wrong to say that the MPP is zero in the agricultural sector.
2. **Commercialization of Agriculture Leads to Inflation:** According to the theory, when the agricultural sector enters the third phase, it becomes commercialized. But the economy is not likely to move smoothly into self-sustained growth because inflationary pressures will start. When many workers shift to the industrial sector, the agricultural sector will experience shortage to labour. In the meantime, the institutional wage also equals the MPP of workers and the shortages of agricultural products arise. All these factors will tend to create inflationary pressures within the economy.
3. **Closed Model:** According Fei and Ranis, the terms of trade move against the industrial sector in the second phase when agricultural output declines and prices of agricultural commodities rise. This analysis is based on the assumption of a closed economy where foreign trade does not exist but this assumption is unrealistic because underdeveloped countries are not close

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but open economies which import agricultural commodities when shortages arise.

- 4. Institutional Wage not Constant in the Agricultural Sector:** The theory assumes that the institutional wage remains constant in the first two phases despite increase in agricultural productivity. This is highly unrealistic because with a general rise in agricultural productivity, farm wages also tend to rise. For instance, the daily real wage rates (at 1966 prices) of agricultural workers for various farms operations in Punjab during the period of the Green Revolution (1967-72) increased by 41.7 per cent to 55.2 per cent.
- 5. Institutional Wage not above the MPP:** The model is based on the assumption of a constant institutional wage which is above the MPP during phases I and II of the development process. There is no empirical evidence to support this assumption. In fact, in labour surplus underdeveloped countries, wages paid to the agricultural workers are much below their MPP.
- 6. Supply of land not fixed:** Fei and Ranis begin with the assumption that the supply of land is fixed during the development process. In the long run, the amount of land is not fixed, as the statistics of crop acreage in many Asian countries reveal. For instance, the index number of area under crops (base 1961-62) in India rose from 82 in 1950-51 to 107.3 in 1970-71.

However, these limitations do not undermine the importance of the Fei-Ranis model with respect to the economic development of labour surplus countries. It systematically analyses the development process from the takeoff to self-sustained growth through the interaction of the agricultural and industrial sectors of an underdeveloped economy.

### Check Your Progress

1. What do Fei and Ranis call the boundary between Phase II and Phase III of the model?
2. Mention some of the criticisms raised against the Fei-Ranis model.

## 3.3 SCHULTZ MODEL

T.W. Schultz is an economist who suggested methods for the development of agriculture. His book titled *Transforming Traditional Agriculture* was published in 1964. It is considered a hallmark in the literature on agricultural development.

### Explanation of the theory

According to his theory, if methods of production are traditional, production would be less even if land is rich and people work hard. On the other hand, application

of science and technology in agriculture enables more production even when soil is poor and people do not work hard. The countries, which are dependent on traditional agriculture are poor and spend most of their income on food.

However, when a country uses developed methods, agricultural food becomes available in abundance, people's income rises and less income of the country is spent on food.

Professor Schultz also explains various methods to transform traditional agriculture. The problem of transforming traditional agriculture is related to investment. Supply of investment in agriculture is not a serious issue but it is difficult to determine the forms of investment. This problem arose because early economists did not explain the economic potential of the agricultural sector.

### **Three important questions**

According to Schultz, it is important to resolve the following three questions in order to understand the economic potential of the agricultural sector:

1. Can low-income communities bring substantial increase in agricultural production by allocating the presently available resources in an efficient manner?
2. Which factors of production determine agricultural success and contribute to the economic growth of a country?
3. Under what conditions is it beneficial to invest in agriculture?

Professor Schultz says: 'Differences in land are least important, differences in the quality of material capital are of great importance, and differences in the capabilities of farm people are most important in explaining the differences in the amount and rate of increase of farm production.'

Several countries, such as Mexico and Japan, have performed better than India in the field of agriculture, not because they have superior quality lands but because they have better agricultural technology.

Schultz believes that too much investment is not required to transform traditional agriculture. A country needs to introduce new factors of production and discard old practices. It needs to learn to handle the risks and uncertainties that might occur due to the introduction of new factors. He says: 'The rate at which farmers who have settled into traditional agriculture accept a new factor of production, depends upon its profit, with due allowance for risk and uncertainty and in this respect the response is similar to that in modern agriculture.'

### **Allocative efficiency in traditional agriculture**

Schultz's theory is based on the hypothesis that 'there are comparatively few significant inefficiencies in the allocation of the factors of production in traditional agriculture.'

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This hypothesis implies:

- (a) 'That no appreciable increase in agricultural production is to be had by reallocating the factors at the disposal of the farmers who are bound by traditional agriculture'. It also means that all factors of production have been allocated after considering marginal returns and marginal costs.
- (b) Individual differences would not hamper agricultural production.
- (c) Farm management expert cannot find out any inefficiency in the allocation of factors.
- (d) All the factors of production have been employed in the best possible manner.

According to Schultz, if any implication mentioned above is proved wrong, the hypothesis of allocative efficiency in traditional agriculture fails. Schultz proved his hypothesis with the help of empirical studies in two villages: one in Guatemala and the other in India.

The village in Guatemala is capitalistic in nature. There is perfect competition in the market and all the factors of production at the disposal of the community are fully used. 'All the evidence revealed in the careful documentation of the behaviour of the people in penny capitalism and in the many tables showing prices, costs and returns strongly support the inference that the people are remarkably efficient in allocating the factors at their disposal in current production. There are no significant indivisibilities in methods of production, none in factors, and none in products. There is no disguised unemployment, no underemployment...'

Regarding the village in India, similar results have been drawn by a researcher. From the data of this village, the researcher infers: 'There is a remarkably close correspondence between the various price estimates. It would appear that the average allocations made by the sample of farms were efficient within the context of the prevailing technical relationships. There is no evidence that an improvement in economic output could be obtained by altering the present allocations as long as the village relies on traditional resources and technology.'

### Doctrine of Zero Value Labour

Many economists believe that in traditional agriculture, there is a proportion of labour force which remains disguisedly unemployed. The implication of this hypothesis is that if a portion of labour force is shifted from the agricultural sector to some other area of work, the total output of the agricultural sector will not fall. This large-scale surplus labour has been considered a characteristic feature of traditional agriculture which leads to poverty in the country.

Schultz refutes this hypothesis. He used 1918–19 *influenza* pandemic year as a test of this hypothesis. Influenza epidemic during the year took a heavy toll on the lives of people living in the rural areas of India. He observed that the total output of agriculture declined in the crop season that followed the epidemic. By this, he inferred that not even 5 per cent of the labour force could be declared as surplus.

## High Returns and Low Capital

*Transforming Traditional  
Agriculture*

Another deep-rooted notion is that traditional agriculture requires relatively low capital investment and gives a high rate of return. During the colonial period, European countries diverted their investments to poor countries and the rich peasants of these countries invested in developed countries. Schultz does not accept this notion and indicates that traditional agriculture requires high capital investment and gives a low rate of return. He also proves that capital acquired from foreign countries was not used in poor countries as a direct production input but in related aspects, such as transport.

Schultz proves that rent from land is a small part of the total factor cost in some poor agricultural communities. This conclusion is quite compatible with the economic theory; although the possibility that rent can be small or even zero is sometimes overlooked in considering the contribution of several factors to agricultural production. The second conclusion is that reproducible material capital is relatively large in many poor agricultural communities. The factor share of reproducible capital is large in some of these communities even though the rate on such capital is low. If the rates of return were always high, the stock could be small and the share relatively large, but if the rate of return is low, as it is in many of these poor agricultural communities, the matter would indeed be baffling given the conventional economic conception that the stock of reproducible capital in poor agricultural communities is small.

Schultz also refutes the argument that large-sized farms are more efficient. According to him, there is no correlation between the size of farms and productivity. Small and large-size farms may be equally efficient or inefficient in different situations.

## Schultz's Suggestions for Transforming Traditional Agriculture

Schultz states that transformation of traditional agriculture depends on the availability and price of non-traditional (modern) agricultural inputs. He says, 'the suppliers of these factors in a very real sense hold the key to such growth.' Producing and distributing these factors at low prices would make farmers accept and use these inputs in agriculture. This would also make their investments in agriculture profitable. According to Schultz, economists have not given due attention to supplies of modern factors of production.

In modern agriculture, the principal sources of high productivity are: (i) modern material inputs and (ii) farm people with modern skills. Modern material inputs should be available in such a form that these can be easily used by poor farmers. Research and development plays a significant role in this regard. Distributional aspect of these inputs is equally important. Distribution can be done by profit-making firms or non-profit agencies. The profit of distribution firms depends on the cost of entry and the size of the market. Since the cost of entry is high and the market is small, there is not enough scope for profits. Therefore, distribution of these inputs needs to be made profitable in order to attract private firms.

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Non-profit agencies can also play an important role in the distribution of these inputs. Local centres can be set up in villages and farmers can be encouraged to test variety of seeds and fertilizers under local conditions.

Also, it is important to equip farmers with modern skills related to agricultural production. Many economists are of the opinion that investing in the training of farmers would shrink investment in more productive ventures. However, this opinion is outrightly rejected by Schultz. He asserts that 'investment in human capital' can have radical implications in transforming traditional agriculture.

### Check Your Progress

3. What is T.W. Schultz known for?
4. What is Schultz's opinion about investment in agriculture?

## 3.4 MELLOR MODEL

John Mellor's theory is another important theory in the field of agricultural development. It explains the transformation of agriculture from a traditional to a modern nature. Professor John Williams Mellor's book titled *The Economics of Agricultural Development* came in 1966, two years after Schultz's *Transforming Traditional Agriculture* was published. Even though Mellor agrees with Schultz in some respects, yet his approach is more realistic and extensive in nature. Mellor explains the evolution of agriculture from its primitive nature to modern agricultural technology.

### Stages of agricultural development

According to Mellor, at any point of time agriculture of a country can be found in one of the following three phases:

- (i) Traditional agriculture
- (ii) Technologically dynamic agriculture (labour-intensive technology)
- (iii) Technologically dynamic agriculture (labour-saving technology)

These three phases of agricultural development can be explained as followed:

#### (i) Traditional agriculture

To explain the process of agricultural transformation, Mellor begins with the concept of traditional agriculture. It is primarily peasant farming characterized by primitive and labour-intensive agriculture. Land, labour and capital are the principal inputs of this kind of agriculture.

There are certain farms in which these inputs come from the same household. Such farms are generally small-sized and are managed by various members of the family. Many of the members work in these farms due to the absence of alternative



avenues of employment. Thus, traditional agriculture suffers from disguised unemployment.

Capital is employed in the form of tools, equipments, bullocks, etc. Since productivity is low in traditional agriculture, increasing labour force and capital results in diminishing returns. Thus, farmers are generally interested in increasing the size of their land holdings so that they can increase their income by keeping the labour force and capital constant. However, increase in land holdings takes place very slowly.

Some non-traditional inputs like fertilizers have been used in traditional agriculture but their impact on total production remains negligible in the absence of other supporting inputs. Similarly, institutional changes such as land reforms also prove ineffective because they are not accompanied by technological changes.

In short, traditional agriculture in phase I ‘tends to be characterized by low levels of utilization of certain resources, low levels of productivity, and relatively high levels of efficiency in combining resources and enterprises. These three factors are interrelated. Collectively they suggest little scope for rapidly increasing either total production or productivity per unit of the resources within the context of a traditional agriculture, but very great scope for increasing total production and resource productivity through technological change.’

## **(ii) Technologically dynamic agriculture – low capital and labour intensive technology**

A number of forces may force farmers, who are following traditional agriculture, to enter a dynamic phase. In this phase, it can be said that agriculture is in the process of development because of the following reasons:

- (a) Agriculture still has a predominant place in the economy.
- (b) Demand for its products is rising due to a number of factors such as increase in people’s income.

These conditions, according to Mellor, call for agricultural development which was not possible earlier but is now facilitated by modern science.

In phase II, ‘the emphasis is on increasing yields per acre of crops and per livestock unit. This occurs in part through the use of innovation which is directly yield increasing. It may also occur in part by increasing efficiency in the use of non-land resources and by putting the resources saved back into the production process. The critical characteristic of phase II as compared with phase I is the constant generation and application of technology which is facilitated by a complex institutional framework.’

Mellor suggested the following steps for agricultural growth:

- (i) Encouragement of institutions:** In traditional agriculture, farmers especially small farmers do not feel motivated to increase agricultural production. Thus, in order to motivate them, it is important to create an

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environment which ensures reasonable returns for them. Institutional changes such as credit, marketing and tenurial ownerships can help in creating such an environment.

- (ii) **Encouragement of research:** During this phase, research programmes play an important role in developing new production techniques. Thus, these programmes should be encouraged a lot. Also, farmers should be encouraged to apply research findings in farming.
- (iii) **Supply of modern inputs:** Supply of new inputs is extremely important to boost the production of agriculture. New seeds, improved breeds of livestock, commercial fertilizers and insecticides need to be supplied to farmers. It is also important to employ people who can produce these modern inputs. Some of these inputs may have to be imported as well.
- (iv) **Setting of institutions for providing servicing facilities:** Effective use of new inputs requires a host of servicing facilities. These include facilities like distribution, marketing and providing credit facility to farmers.
- (v) **Development of communication system:** The final success of programme depends upon training farmers. 'The rate of increase in agricultural production will in practice normally be limited by the rate at which trained personnel can be provided to operate various developmental institutions.'

In short, the progress of agriculture in the second phase is a continuous process.

### (iii) Technologically dynamic agriculture – labour-saving technology

According to Mellor, as second phase of agricultural development gains momentum, entry into third phase becomes imminent. He says, 'This tends to be a technologically dynamic phase in that institutions are developed which create a stream of labour-saving mechanical innovations and facilities for providing, distributing and servicing such machines so that a continuum of increasing labour productivity is created.'

This phase occurs when the process of economic development has been under way for some time. At this stage, capital formation is sufficient to permit rapid expansion of the non-farm sector and allow gradual intensification of capital use in agriculture. Man-land ratio falls and average size of farm increases.

It may be pointed out that sequence of phases, as suggested by Mellor, applies in most of the low-income nations at present. However, agricultural development in many countries has not followed this sequence. For instance, in the USA, basic knowledge for mechanical innovation had been available for long, hence, agriculture in this place could go from phase I to phase III directly. Also,

labour-land and labour-capital ratios in this place encouraged labour-saving technology rather than labour-intensive technology. The presence of vast quantities of unexploited but highly productive land, large supplies of foreign capital, and rapidly growing urban industry, all favoured mechanization of agriculture at a fast pace.

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### Check Your Progress

5. Mention the three phases of agriculture, one of which a country can go through, according to Mellor.
6. Why do increasing labour force and capital result in diminishing returns in traditional agriculture?

## 3.5 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Fei and Ranis call the boundary between Phase II and III as the 'commercialization point' in their model.
2. Some of the criticisms raised against the Fei-Ranis model are the following:
  - MPP not Zero
  - Commercialization of Agriculture Leads to Inflation
  - Closed Model
  - Institutional Wage not Constant in the Agricultural Sector
3. T.W. Schultz is an economist who suggested methods for the development of agriculture. His book entitled *Transforming Traditional Agriculture* was published in 1964. It is considered a hallmark in the literature on agricultural development.
4. Professor Schultz also explains various methods to transform traditional agriculture. The problem of transforming traditional agriculture is related to investment. Supply of investment in agriculture is not a serious issue but it is difficult to determine the forms of investment. This problem arose because early economists did not explain the economic potential of the agricultural sector.
5. According to Mellor, at any point of time agriculture of a country can be found in one of the following three phases:
  - (i) Traditional agriculture
  - (ii) Technologically dynamic agriculture (labour-intensive technology)
  - (iii) Technologically dynamic agriculture (labour-saving technology)

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6. Capital is employed in the form of tools, equipments, bullocks, etc. Since productivity is low in traditional agriculture, increasing labour force and capital results in diminishing returns. Thus, farmers are generally interested in increasing the size of their land holdings so that they can increase their income by keeping the labour force and capital constant. However, increase in land holdings takes place very slowly.

### 3.6 SUMMARY

- John Fei and Gustav Ranis model (commonly known as the Ranis-Fei Model) concentrates on the movement of labour from agricultural to non-agricultural field. This shift of labour is considered the main hindrance to economic development.
- Ranis-Fei theory relates to an underdeveloped labour-surplus and resource-poor economy in which the vast majority of the population is engaged in agricultural activities irrespective of the prevalent unemployment coupled with an increase of population.
- Fei and Ranis have further shown that their model satisfies the conditions of balanced growth during the take-off process. Balanced growth requires simultaneous investment in both the agricultural and industrial sectors of the economy.
- The Fei-Ranis model shows the interaction between the two sectors in initiating and accelerating development. Moreover, its explanation of the Lewis turning point is more realistic. But the major merit of the theory is that it shows the importance of agricultural products in capital accumulation in underdeveloped countries.
- T.W. Schultz is an economist who suggested methods for the development of agriculture. His book entitled *Transforming Traditional Agriculture* was published in 1964. It is considered a hallmark in the literature on agricultural development.
- Schultz's theory is based on the hypothesis that 'there are comparatively few significant inefficiencies in the allocation of the factors of production in traditional agriculture.'
- Many economists believe that in traditional agriculture, there is a proportion of labour force which remains disguisedly unemployed. The implication of this hypothesis is that if a portion of labour force is shifted from the agricultural sector to some other area of work, the total output of the agricultural sector will not fall.
- Non-profit agencies can also play an important role in the distribution of these inputs. Local centres can be set up in villages and farmers can

be encouraged to test variety of seeds and fertilizers under local conditions.

- John Mellor's theory is another important theory in the field of agricultural development. It explains the transformation of agriculture from a traditional to a modern nature.
- Capital is employed in the form of tools, equipments, bullocks, etc. Since productivity is low in traditional agriculture, increasing labour force and capital results in diminishing returns.
- Some non-traditional inputs like fertilizers have been used in traditional agriculture but their impact on total production remains negligible in the absence of other supporting inputs. Similarly, institutional changes such as land reforms also prove ineffective because they are not accompanied by technological changes.

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### 3.7 KEY WORDS

- **Marginal Return:** It refers to additional output resulting from one unit increase in the use of variable inputs, while other inputs are held constant.
- **Surplus Labour:** It refers to excess of labour.
- **Inflation:** It refers to a general continuous increase in prices.
- **Hypothesis:** It is an assumption, an idea that is proposed for the sake of argument so that it can be tested to see if it might be true.

### 3.8 SELF ASSESSMENT QUESTIONS AND EXERCISES

#### Short-Answer Questions

1. Mention the assumptions of the Fei and Ranis Model.
2. Write a short note on the Doctrine of Zero Value Labour.
3. List the suggestions stated by John Mellor for agricultural growth.

#### Long-Answer Questions

1. Explain the working of the Fei and Ranis Model.
2. Critically analyse Schultz's suggestions for transforming traditional agriculture.
3. Discuss the significant features of Mellor's model of agricultural development.

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### 3.9 FURTHER READINGS

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#### NOTES

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## UNIT 4 LEWIS MODEL OF UNLIMITED SUPPLY OF LABOUR

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*Lewis Model of Unlimited  
Supply of Labour*

### NOTES

#### Structure

- 4.0 Introduction
- 4.1 Objectives
- 4.2 Assumptions and Concept of the Lewis Model
  - 4.2.1 Case of Reinvestment of Capitalist's Surplus (Profit)
  - 4.2.2 Features of the Lewis Model
  - 4.2.3 Criticism of the Lewis Model
- 4.3 Answers to Check Your Progress Questions
- 4.4 Summary
- 4.5 Key Words
- 4.6 Self Assessment Questions and Exercises
- 4.7 Further Readings

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### 4.0 INTRODUCTION

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W. Arthur Lewis (a noble Laureate) in the mid-1950s put forward a model of the unlimited supply of labour or surplus labour economy. The surplus labour implies that amount of manpower which when withdrawn from the process of production results in no decline in the amount of output. Further, this model envisages that capital accumulation takes place in the modern industrial sector to draw labour from the subsistence agriculture sector. This model was later modified by Fei and Ranis but the essence of the two models is the same. Each model assumes that the existence of surplus labour in the economy is the main component which in simple words is enormously disguised unemployment in agriculture.

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### 4.1 OBJECTIVES

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After going through this unit, you will be able to:

- State the assumptions applicable to the Lewis Model of Unlimited Supply of Labour
- List the features of the Lewis model of Unlimited Supply of Labour
- Identify the criticisms raised against the Lewis model of Unlimited Supply of Labour

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## 4.2 ASSUMPTIONS AND CONCEPT OF THE LEWIS MODEL

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Let us first discuss the various assumptions of the Lewis Model.

#### Assumptions of the Lewis Model

- (i) There is a dual economy, which is characterized by a traditional, over-populated rural subsistence sector furnished with zero MPL and the high productivity modern industrial sector.
- (ii) The subsistence sector does not make use of reproducible capital, while the modern sector uses the produced means of capital.
- (iii) The production in the advanced sector is higher than the production in the traditional and backward sector.
- (iv) The supply of labour is perfectly elastic i.e., the supply of labour is greater than the demand for labour.

Further, Lewis identified the following sources of unlimited labour:

- (i) The overpopulated sector like agriculture where the number of working hands is more than the demand of the sector which is a source of disguised unemployment.
- (ii) The backward sector of the economy where people are having temporary jobs like that of porters, shoe shiners, waiters etc. So, if the number of working hands is reduced in this sector, there would be no fall in production.
- (iii) Housewives performing household chores are considered unemployed as their indirect contribution to the economy is never recorded.
- (iv) The landlords and feudal elements are having an army of tenants for the sake of exerting their influence, power and prestige. They do not make any contribution towards production, and they are prepared to work even at less than subsistence wages.
- (v) The high birth rate in underdeveloped areas leads to increasing unemployment.

#### The Concept of the Lewis Model

The Lewis model is a classical model which states that the unlimited supply of labour can be held at the prevailing subsistence wages. The modern and industrial advanced sector could be developed based on the subsistence sector. Therefore, to achieve this aim, labour needs to be migrated from the agriculture sector to the traditional or modern industrial sector.

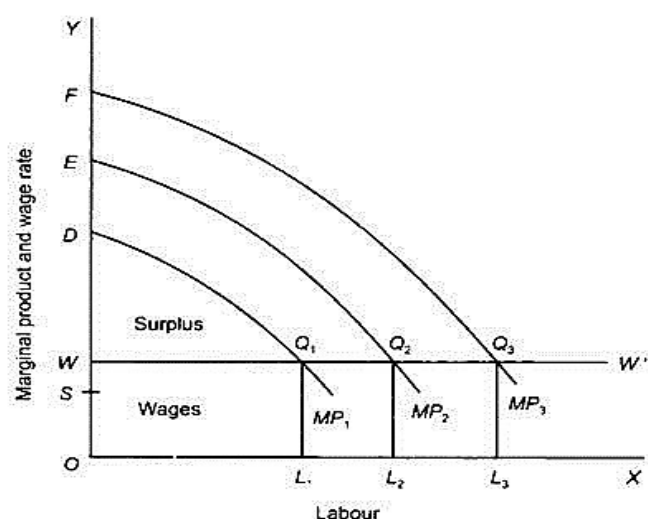
Lewis suggested that wages in the individual sector remain constant and capitalists will earn the surplus. Such surplus will be reinvested in a modern sector which results in absorbing the labour which is migrated from the subsistence



sector. Therefore, by doing so, labour which was considered to be disguised unemployed, will find employment. Thus, labour transfer and modern sector employment growth is brought forward by output expansion in this sector. Moreover, the speed at which production and expansion happens in the modern sector results in growth in capital investment in the modern sector. Though wages are assumed to be constant in this sector, yet Lewis suggested that urban wages are at least 30 per cent higher than average rural income which encourages workers to migrate from the subsistence sector to the modern sector. The process of expansion and capital accumulation in the modern sector and the absorption of labour has been explained in 4.1.

*Lewis Model of Unlimited Supply of Labour*

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**Fig. 4.1** Capital Expansion and Growth in Labour Employment

The OS represents the real wages a worker is entitled to receive if he works in the subsistence sector. The OS is the average product per worker in this sector. Whereas, OW is the wage rate fixed in the modern sector which is greater than (almost 30 per cent) the wages rate available in the subsistence sector. Though, labour available in the modern sector at the given wages rate is constant.

With a given initial amount of industrial capital, the demand for labour is given by the marginal product curve  $MP_1$ . Based on the principle of profit maximization, at the wages rate OW, the modern sector will employ  $OL_1$  labour at which the marginal product of labour equals the given wages rate OW. Therefore, the total number of labour in the modern sector will be  $OWQ_1L_1$  and  $WQ_1D$  will be the capitalist surplus. Here, Lewis assumes that all wages are consumed and all profits are saved and invested.

### 4.2.1 Case of Reinvestment of Capitalist's Surplus (Profit)

When capitalists will reinvest their profit for setting up new factories or expanding the existing ones, the stock of capital assets in the modern sector will increase. This will result in the demand for labour or marginal productivity curve of labour to

## NOTES

shift outward, for instance from  $MP_1$  to  $MP_2$  in Figure 4.1. With  $MP_2$  as the new labour demand curve and the wages rate remaining constant at  $OW$ , amount of labour  $OL_2$  will be employed in the modern sector.

In this new equilibrium system, profit for capitalists will rise to  $WQ_2E$  which is larger than the earlier one  $WQ_1D$ . The new surplus profit will be further invested with the result that enhances the capital stock and demand or marginal productivity of labour curve and shifts the labour curve upward to  $MP_3$  position. This profit reinvestment and absorbing surplus labour will continue until the labour surplus is fully absorbed in productive employment in the modern sector. The rising surplus serves as an incentive to reinvest in the modern sector and expand labour productivity and employment which migrated from the subsistence sector.

### 4.2.2 Features of the Lewis Model

- (i) This model deals with the dual concept of the subsistence sector and modern sector.
- (ii) Labour remains constant.
- (iii) When capital investment happens to the modern sector then labour migrates from the subsistence sector.
- (iv) Each profit surplus and reinvestment result in an upward shift in labour employment in the modern sector.
- (v) Surplus profit reinvestment and labour productivity curve shift upward continue until surplus labour is fully absorbed in the modern sector from the subsistence sector.

### 4.2.3 Criticism of the Lewis Model

The criticism of the Lewis model is as follows:

- (i) **Disproportionate use of Labour and Capital:** This model assumes that there exists proportionality between labour migration and employment in the modern sector and rate of accumulation in the modern sector. But if the capitalists reinvest their profits in labour-saving capital equipment then as a result, employment will not be generated rather jobs will decline rapidly.
- (ii) **Seasonality of Labour:** Lewis did not pay attention to the seasonality of labour where labour demand in the traditional agriculture sector is at peak during the harvesting and sowing season. In this season, positive opportunity cost is involved while migrating labour from agriculture to the modern sector and labour transfer reduces productivity.
- (iii) **Rise in Urban Wages:** When productivity rises in the subsistence sector then wage rate increases. Furthermore, in the modern sector, wages rate is fixed by laws or the union controls them. Therefore, the chance of increasing labour in the modern sector is less but it indirectly makes rural wages attractive.

- (iv) **Ignorance to Balanced Growth:** The Lewis model ignored the balanced growth between the subsistence sector and the modern sector. But theories suggested that there is linkage between agriculture growth and industrial expansion, especially in underdeveloped countries. Therefore, if a part of the profit surplus is not devoted to the agriculture sector then industrial growth will be affected.
- (v) **Role of Leakages:** The Lewis model is completely silent on the leakages in the economic sector. For instance, if surplus profit by the capitalists is diverted to savings then employment will not rise in the industrial sector. But whenever surplus is higher, capitalists use to spend it in on higher consumption rather than on industrial capital investment. So, this model completely ignores these facts.
- (vi) **Process of migration:** The migration process from the agriculture sector to the modern sector is regarded as smooth and costless. But it is not so, as the industry requires different types of labour and most of such migrated labour could not fulfil that criterion.

The Lewis model has several limitations but it retains the highest degree of analytical value. It points out the role of capital and labour from the subsistence sector and the modern sector. Further, this model visualises the systematic and pertaining analysis of the growing problem of the dual sector and bring out the crucial importance of capital reinvestment and labour absorption from agriculture to the industry while increasing the employment. Finally, the Lewis model tries to bridge which exists in the labour market in underdeveloped economies by putting forward the linkage of capital and productivity enhancement in the modern sector while the productivity of the subsistence sector remains unaffected.

#### Check Your Progress

1. Mention any two sources of unlimited labour identified by Lewis.
2. List two features of Lewis Model of Unlimited Supply of Labour.

### 4.3 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Two sources of unlimited labour identified by Lewis are the following:
  - (i) The overpopulated sector like agriculture where the number of working hands is more than the demand of the sector which is a source of disguised unemployment.
  - (ii) The backward sector of the economy where people are having temporary jobs like that of porters, shoe shiners, waiters etc. So, if the number of working hands is reduced in this sector, there would be no fall in production.

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2. Two features of Lewis Model of Unlimited Supply of Labour are the following:
  - (i) This model deal with the dual concept of the subsistence sector and modern sector.
  - (ii) Labour remains constant.

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### 4.4 SUMMARY

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- W. Arthur Lewis (a noble Laureate) in the mid-1950s put forward a model of the unlimited supply of labour or surplus labour economy.
- The high birth rate in underdeveloped areas leads to increasing unemployment.
- The Lewis model is a classical model which states that the unlimited supply of labour can be held at the prevailing subsistence wages. The modern and industrial advanced sector could be developed based on the subsistence sector.
- This model deals with the dual concept of the subsistence sector and modern sector.
- This model assumes that there exists proportionality between labour migration and employment in the modern sector and rate of accumulation in the modern sector.
- The Lewis model has several limitations but it retains the highest degree of analytical value. It points out the role of capital and labour from the subsistence sector and the modern sector.

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### 4.5 KEY WORDS

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- **Dual economy:** A dual economy refers to the existence of two distinct types of economic segments within an economy.
- **Subsistence sector:** It relies on natural resources to provide basic needs.

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### 4.6 SELF ASSESSMENT QUESTIONS AND EXERCISES

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#### Short-Answer Questions

1. What is the main concept of Lewis Model of Unlimited Supply of Labour?
2. State the main sources of unlimited labour as identified by Lewis.

### Long-Answer Questions

*Lewis Model of Unlimited  
Supply of Labour*

1. Explain the functioning of Lewis Model of Unlimited Supply of Labour with the help of an example.
2. What are the criticisms raised against Lewis Model of Unlimited Supply of Labour?

### NOTES

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## 4.7 FURTHER READINGS

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## BLOCK - II

### FARMING SYSTEM

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#### NOTES

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## UNIT 5 LAND HOLDING PATTERN AND LAND REFORMS

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### Structure

- 5.0 Introduction
- 5.1 Objectives
- 5.2 Land Holding Pattern
- 5.3 Land Reforms: Impact on Agriculture Production
  - 5.3.1 Approaches to Land Reforms: A Break with the Past
  - 5.3.2 Shortcomings in the Past
- 5.4 Ownership vs Tenancy Cultivation
  - 5.4.1 Advantages of Ownership
  - 5.4.2 Case for Tenancy Cultivation
- 5.5 Large Farms vs Small Farms
  - 5.5.1 Definition of a Small Farm
  - 5.5.2 Economies of Large Farms
  - 5.5.3 Limited Advantages of Large Farms
  - 5.5.4 Persistence of Small Farms
- 5.6 Land Reforms and Status of Agriculture
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- 5.9 Key Words
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### 5.0 INTRODUCTION

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Lands reforms govern all the issues related to land management and regulations pertaining to the workers and the owners of these lands. Land reforms, naturally, are an important part of Indian agriculture. But these regulations were not always in the favour of the workers, in fact, they were quite distorted in the pre-independence era, when the main aim of the Britishers was to extract taxes from the land. In this unit, you will study about the land holding pattern and the impact of land reforms on agricultural production.

## 5.1 OBJECTIVES

After going through this unit, you will be able to:

- Identify the types of land holdings
- List the causes of land fragmentation in India
- Discuss approaches to land reforms adopted through the Five Year Plans in India
- Describe the advantages for ownership of land
- State the initiatives taken by the Indian government in the field of agricultural development

## NOTES

## 5.2 LAND HOLDING PATTERN

The term land holding or agriculture holding indicates the average size of agricultural land held by the farmer in India. According to the 10th Edition of Agriculture Census data for 2015-2016 which come out in 2019, the number of small and marginal agricultural land holdings in the country, also known as operational holdings, increased marginally about 86.21 per cent of total operational holding to 126 million as against 84.97 per cent in the earlier census of 2010-11. This indicated that more people own smaller land holdings than the earlier one.

There are four types of holdings:

1. **Economic holding:** This indicates the size of holding which is going to provide the required support to a farmer's family. Further, this holding also provides a chance of producing sufficient produce to support the peasant and his family with reasonable comfort after paying his necessary expenses. The size of economic holding varies in India from region to region. Some economists suggested size of 40-50 acres in some region but 10-12 acres in other regions. Factors such as climatic conditions, nature of soil and irrigation facilities in the region play an important role in determining the size of economic holdings.
2. **Basic holding:** The basic holding, on the other hand, provides only subsistence to the farmers and size of such holding is smaller than the economic holding.
3. **Optimum holding:** The Agrarian Committee defines optimum holding as the size of three times of economic holding.
4. **Family holding:** The Five-Year Plan in India introduced the family holding concept. This implies a landholding area which is equivalent to either a unit of an average family having a pair of bullocks or plough unit. Further, the land reforms panel defined family holding as a holding which provides annual income worth ₹ 1200 to an average farmer family.

The Union Ministry of Agriculture and Farmers Welfare disclosed the following categories of operational holdings in India which is presented in Table 5.1.

**Table 5.1** Operational Holding Categories

S. No.	Category	Size
1	Marginal	Below 1.00 hectare
2	Small	1.00-2.00 hectare
3	Semi-Medium	2.00-4.00 hectare
4	Medium	4.00-10.00 hectare
5	Large	10.00 hectare and above

## NOTES

The operational holdings are also classified in three social groups which are Schedule Castes, Schedule Tribes and Others. The Agriculture Census 2015-16 also published state-wise average size of operational holdings in the country. Table 5.2 presents a glimpse of operational holdings and are operated upon by the various sizes in India in 1985-86.

**Table 5.2** Operational Holding and Area Operated by Size Classes in India (1985-86)

Category	Size of holding (in hectare)	No. of holding (in millions)	%	The total area operated (million hectares)	%	The average area operates (hectare) per holding (hectare)
a) Marginal	0-1.0	56.8	58.1	13.2	0.4	0.4
b) Small	1.0-2.0	17.9	18.3	25.5	15.6	1.4
c) Semi medium	2.0-4.0	13.3	13.6	36.6	22.3	2.8
d) Medium	4.0-10.0	7.9	8.1	47.0	28.7	5.9
e) Large	10 and above	1.9	2.0	33.2	20.2	7.2
<b>Total</b>		<b>97.8</b>	<b>100.0</b>	<b>163.9</b>	<b>100.0</b>	<b>1.7</b>

The statistics of operational holding indicates that 97.8 million holdings in 1985-86 whereas 58.1 per cent belongs to a marginal category and remaining to a small category, semi-medium and large which is 18.6 per cent, 13.6 per cent and 2.0 per cent respectively. Table 5.2 revealed that average per farmer landholding in India was merely 1.7 hectare which is a result of continuing subdivision of land and fragmentation of holdings.

The latest Agriculture Census finding comparisons from the earlier census is presented in Table 5.3 which indicates that the number of small and large holdings increased since the previous census but many large holdings declined at the same time. Further, landholdings used for agriculture, witnessed a growth of 5 per cent in 2015-16 from 2010-11. However, results also indicated that a total number of



operational holdings in India have increased from 138 million to 146 million by 2015-16.

**Table 5.3** Land Holding Pattern Comparison

Classification	Range (hectare)	2010-11 (million)	2015-16 (million)	% change
Small	<1	117.25	125.86	7.34%
Medium	1-4	19.72	19.3	-2.13%
Large	4-10	0.98	0.83	-15.31%

## NOTES

The major findings of Agriculture Census 2015-16:

- The number of small and marginal land holdings have registered a marginal increase in 2015-2016. This indicates that there are smaller landholdings compare to the earlier census.
- The percentage of women landholders has increased from 12.79 per cent to 13.87 per cent in 2015-2016. This indicates that more women are participating in the management and operations of agriculture.
- The small and marginal holdings which consisted of land size below 2 hectares registered total landholdings of 86.21 per cent which registered a growth of 1.2 per cent compared to 2010-11 census.
- The large holdings account only 9 per cent but marginal, small and medium holdings constitute a lion's share.
- The breakdown of landholding and operational area according to the Agriculture Census 2015-16 is given below in Table 5.4.

**Table 5.4** Category-wise Land Holding and Operational Area (2015-16)

Category	No. of Land Holding (million)	Operational Area
Small	86.2 %	47.3 %
Medium	13.2 %	43.6 %
Large	0.6 %	9.0 %

a. State-wise landholding of some of the major states as per Agriculture Census 2015-16:

**Table 5.5** State-wise Land Holding (2015-16)

State	No. of Land Holding (million hectares)
Uttar Pradesh	23.82
Bihar	16.41
Maharashtra	14.71
Madhya Pradesh	10.0
Karnataka	8.68
Andhra Pradesh	8.52
Tamil Nadu	7.94
Rajasthan	7.65
West Bengal	7.24

The state-wise land holdings indicate that Uttar Pradesh has the highest landholdings which constitute 16 per cent of the total landholdings in India. On the other hand, the state of West Bengal holds the least number of agricultural holdings.

## NOTES

### Causes of Land Fragmentation

- i. Population:** The increasing population of India has been putting immense pressure on land. As a result, people started to put more pressure on agriculture in the absence of an alternate occupation and which leads to subdivision.
- ii. Inheritance:** The ancestral property is divided in India which causes sub-division of land. When the family size is large then land fragmentation would be higher and per member, the land share would be small.
- iii. Nuclear Family:** Due to urban development and growing industrialization, the joint family system is disintegrating in India. This has further lead to sub-division of land among the family members.
- iv. Rural Indebtedness:** At times when farmers borrow money from moneylenders, they are forced to forfeit some portion of land to the moneylenders. This in turn leads to fragmentation of land.
- v. Crop Sharing:** The landowners in India lease out their land to small tenants and ask them to cultivate on their land. By doing so, they surpass the land reform laws and sub-divide the land among the tenants. As a result, landowners deliberately reduce landholding to small uneconomic operational holding.

### Limitations of Land Fragmentation

The land sub-division limitations are as follows:

- i. Land Wastage:** Due to the sub-division of land, boundary area has no use. Therefore, this area becomes unfit for cultivation. Further, due to fragmentation of land production also depreciates.
- ii. Management Difficulties:** Land fragmentation results in wastage of time and resources because inputs like seeds have to be transported to a different field which increases the cost as well as leads to wastage of time and other resources.
- iii. Litigation:** When land is fragmented then more disputes arise among family members leading to loss of time and money.
- iv. Disguise Unemployment:** As each family member is able to find a job on a small land, therefore, it increases disguised unemployment.
- v. Technology Adoption:** As the landholding is small therefore modern technology and machines cannot be used for cultivation and harvesting. Further, the adoption of such technology would not be financially viable for small land owning farmers.

### Check Your Progress

1. Name the types of land holdings.
2. State any two limitations of land fragmentation.

### NOTES

## 5.3 LAND REFORMS: IMPACT ON AGRICULTURE PRODUCTION

Land reforms refer to all those reforms which are concerned with land ownership, land holdings and landlord-tenant relationship. According to erstwhile Planning Commission's report, 'The objectives of land reform policy have been to remove such motivational and other impediments as arise from the agrarian structure inherited from the past, and also to eliminate all elements of exploitation and social injustice within the agrarian system so as to ensure equality of tenurial status and opportunity to the vast sections of the rural population.'

Land reforms mainly encompassed the following components:

- Abolition of intermediaries
- Tenancy reforms
- Ceiling of land holdings and distribution of surplus land
- Consolidation of holdings
- Compilation and updation of land records
- Agrarian reorganization
- Cooperative farming

### Objectives of land reforms

Land reforms were introduced in post-independent India to stop the exploitation of the actual tillers of the soil and pass on the ownership of the land to them. Since Independence, the objectives of the Land Reforms Policy have been as follows:

- Restructuring agrarian relations to achieve an egalitarian social structure
- Removing impediments that arise from the agrarian structure inherited from the past
- Eliminating exploitation in land relations
- Increasing agricultural production
- Regulation of the rent of agricultural land
- Security of tenure and conferment of ownership rights on tenants

## NOTES

### 5.3.1 Approaches to Land Reforms: A Break with the Past

P.C. Joshi, a thinker, has pointed out that various attempts to alter the pattern of distribution of land holdings assumed four types of approaches in land reforms:

- Land reforms through statutory enactments made and implemented by the state legislatures on the lines broadly indicated by the central government
- Land reforms due to the pressures of militant peasant action like Telangana and Naxalbari movements and land grab movement by various left peasant organizations
- Land reforms by persuading landlords to gift their land like the Bhoodan-Gramdan Movement under the leadership of Vinoba Bhave
- Land reforms through legislative enactments in combination with peasant mobilization like the controlled land seizure in West Bengal during 1967–69 under the United Front Government and protection of poor peasants in Kerala under the CPI Ministry

Land reform continues to be a state subject but the central government provides a framework for the enactments of land reform measures. Following the policy directive of the First Five Year Plan, wherein increasing agricultural production was accorded the top priority, the government set up the Central Committee for Land Reforms to review the progress of land reforms in different regions. This Committee was also entrusted the task of advising the states on their land reform proposals.

The first major landmark in land policy came with the report of the Congress Agrarian Reform Committee, 1949, under the chairmanship of J.E. Kumarappa. The Committee was in favour of abolishing feudal intermediaries like zamindars and *jagirdars*. Before formulating the proposals for the Second Five Year Plan (1956–61), the Planning Commission constituted a panel to review the implementation of land policy proposed in the First Plan and take further steps in connection with the Second Plan.

The proposal for the Second Plan included:

- Abolition of intermediaries
- Tenancy reforms (regulation of rent, security of tenure for tenants and conferment of ownership on them)
- Agrarian re-organization, including consolidation of holdings and prevention of subdivision and fragmentation

The proposals in the Second Five Year Plan had to be adapted and pursued in each state with due regard to local conditions. In November 1969, the Chief Ministers' Conference, convened by the Ministry of Food and Agriculture, emphasized the need for a central body to examine the progress of land reforms and provide guidance to state governments.

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In September 1970, a subsequent Conference of Chief Ministers on Land Reforms held in Delhi decided that the entire range of problems connected with land should be referred to a central body. Accordingly, the Central Land Reforms Committee was constituted under the chairmanship of the Union Minister of Agriculture. It looked into the questions of ceiling, exemption, compensation, distribution of surplus land and implementation of reforms.

The Draft Fifth Five Year Plan (1974–79) assessed the implementation of land reforms as follows:

‘... the laws for the abolition of intermediary tenures have been implemented fairly efficiently, whilst in the fields of tenancy reform and ceiling on holdings legislation, it has fallen short of the desired objectives and implementation of the enacted laws has been inadequate’.

The Sixth Plan (1980–85) observed that unsatisfactory progress of land reforms has not been due to deficiencies in the policy but due to delayed implementation of reforms and conferment of ownership rights. Therefore, both the Sixth and the Seventh Plans stressed on the effective implementation of land reforms policy.

The Seventh Plan enunciated land reforms to be an intrinsic part of anti-poverty strategies and their need has been reinforced in every successive Plan. The Eighth Plan (1992–97) stressed that landlessness was the root cause of rural poverty. Thus, it laid down seven objectives of land reforms which are as follows:

- Restructuring of agrarian relations to achieve egalitarian social structure
- Elimination of exploitation in land relations
- Actualization of the goal of ‘land to the tiller’
- Improvement of the socio-economic conditions of the rural poor by widening their land base
- Increasing agricultural productivity
- Facilitating land-based development of the rural poor
- Infusion of a greater measure of equality in local institutions

Land reforms continued to be an important policy instrument for poverty alleviation in the Ninth Plan (1997–2002). The Plan emphasized the following issues:

- Detection and redistribution of the surplus land that has been ceiled
- Stringent enforcement of the ceiling laws
- Rights of sharecroppers to be recorded and security of tenure to be provided to tenants
- Leasing of land to be made permissible within the ceiling limit
- Access to wasteland and common property resources to be given to the poor
- Ensuring land rights of women

## NOTES

- Consolidation of land holdings to be accelerated with active involvement of village people
- Updation of land records

The Tenth Plan (2002–07) admitted that the need for effective implementation of the existing land ceiling laws cannot be over-emphasized. The changes in the agrarian economy call for a fresh look at tenancy laws. Farmers owning land below the ceiling limit may be provided a guarantee that their land would not be taken away. The fixation of rent could be left to market forces.

Keeping this in view, the National Agricultural Policy (2000), inter alia, wanted the following issues to be accorded utmost attention for rural development and land reforms:

- Consolidation of holdings all over the country on the pattern of North-western states
- Redistribution of ceiling-surplus lands and waste lands, along with some initial capital, among the landless farmers and unemployed youth
- Recognition of the rights of the tenants and sharecroppers under tenancy reforms
- Updation, improvement and computerization of land records and issuance of land pass-books to farmers
- Recognition of women's rights on land

### 5.3.2 Shortcomings in the Past

Since land reform is a state subject, the central government's role is restricted to formulating general directions and persuading the state governments to implement them. Some of the shortcomings in the implementation of land reforms have been as follows:

- Legal definitions of the terms related to land reforms have left room for different kinds of interpretation, which have affected the process of implementation of land reforms.
- Distribution of land continues to be skewed. Agricultural workers, particularly from scheduled castes and scheduled tribes, who constitute the bulk of agricultural labour force, have not gained much from the abolition of zamindari.
- There remains a wide gap between the land distributed and its actual occupation by the beneficiaries due to court proceedings (they cannot afford the cost involved in court proceedings).
- Identification of **benami land** (land held under a different name to circumvent the law) is not possible through the efforts of administration alone. For this, support of local organizations of the beneficiaries is necessary.

Local civil organizations have to come up with innovative ideas to rectify inequities of land ownership in the rural areas as in case of Pani Panchayat in Ralegaon and Siddhi in Maharashtra.

Under this, every member of the village, irrespective of the size of his land holding, has a proprietary right over water for irrigation. As the water available to each member is limited, members with large land holdings have been persuaded to lease their land to small farmers and agricultural labourers who have water rights but no land.

The arrangement has allowed the landless farmers to have access to land for farming. The large landholders have also benefitted as they receive rent for land, which would otherwise have remained uncultivated for lack of irrigation.

#### Check Your Progress

3. What have been the objectives of the Land Reforms Policy since Independence?
4. What are the factors responsible for the need of land reforms in India after Independence?

#### NOTES

### 5.4 OWNERSHIP VS TENANCY CULTIVATION

In this section of the unit, we will concentrate on the two types of cultivation based on control of land, namely, ownership and tenancy cultivation. Both owner cultivation as well as tenant cultivation have some advantages.

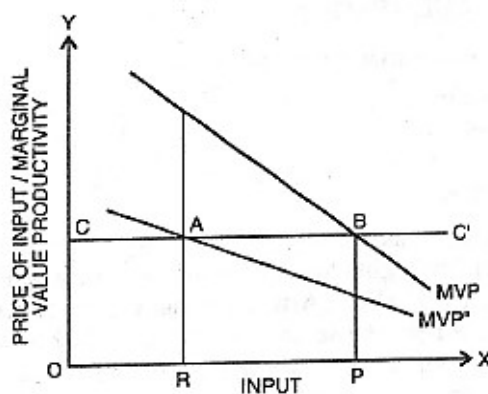
In the paragraph that follows, we will, in the first instance, describe the advantages of owner cultivation.

#### 5.4.1 Advantages of Ownership

1. It has been generally held that the grant of ownership rights to a cultivator will turn sand into gold, if we believe Arthur Young. He had remarked, 'Give a man the secure possession of a bleak rock and he will turn it into a garden: give him a nine- year lease of a garden and he converts it into a desert.' This view, as expressed by the advocates for grant of ownership to the cultivators, is said to be based upon the psychological proposition that the assurance of the reward for the work put in, is the best incentive for work. Ownership provides for this assurance and therefore, the incentive. When the cultivator of a piece of land is its owner, there is no other person to demand a share in the reward for the work put in.

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- The incentive provided by the ownership, however, is not the only factor responsible for the increase in production in case of owner cultivation. The element of rationality also strengthens such a tendency. The institution of tenancy is such that the rational behaviour (and not necessarily the lack of incentive) will require the tenant to under-utilise the given resources as compared with the owner-cultivator. This can be proved with the help of the following diagram (Figure 5.1).



**Fig.5.1** Increase in Production in Case of Owner-Cultivation

Suppose, there is a cultivator for whom the marginal return to different units of a variable input (say, fertilizers in the present case) combined with a given piece of land is shown by the curve MVP (marginal value productivity curve). Suppose, the only money cost is the amount spent on fertilizers which can be purchased at a given fixed price. CC' in the diagram then shows the average price of the input used (we ignore the cost of labour in order to simplify the analysis). If the cultivator could keep to himself all that he was producing (as in the case with an owner cultivator), he will use OP units of fertilizers when in equilibrium. (Equilibrium in production, under perfect competition is reached when the marginal value productivity of the input used is equal to its price)

Now, suppose the land that the cultivator is cultivating has been leased in by him (i.e., he is a tenant) and he has to pay 50 per cent of the produce as rent. In that case, for his purpose, marginal value productivity of different units of the input will be shown by the curve MVP' (i.e., half of the return for each unit of input, as compared with the original situation). In his own interest, he should not use more than OR units of the input. The profits earned by him will be maximum only when he uses OR units of fertilizers.

We may, however, note a few exceptions to this conclusion. Firstly, if the tenant is to pay a fixed cash rent, and not the share rent, the use of input by the tenant will be the same as is in the case of an owner cultivator. Again, if,



besides the output, the costs are also divided between the tenant and the owner in the same proportion in which the output is divided, the amount of input used will be the same, both under tenancy and owner cultivation. In both of these cases, the intersection between the marginal value productivity curve meant for the tenant and the cost curve pertaining to cost, incurred by the tenant will be at the input level of OP.

The reason for this is as follows:

In the first case, marginal value productivity for the tenant will be represented by the MVP curve, i.e., the same which represents the marginal value productivity for owner. This is so because fixed rent paid by the tenant is not treated as a share of output. It is treated as a cost. The  $CC^1$  curve in this case will also be the same as the one that pertains to the owner. This is so because the fixed rent is a part of the fixed cost, and we know that changes in fixed costs do not influence the price of variable inputs. The intersection between MVP curve and  $CC^1$  curve in case of fixed rent will thus indicate the equilibrium level with OP input. The only difference will be that the profits earned by the tenant will be reduced by the amount of the fixed rent that he pays. In the second case, though  $MVP^1$  will be the curve to be considered (instead of MVP),  $CC^1$  curve will also move down by the same proportionate distance. So, again the intersection between the two curves will indicate the use of input amounting to OP.

There is, however, no denying the fact that in case of share tenancy (the most prevalent form of tenancy), the resources are generally likely to remain underutilized and grant of ownership to the tenants will take the economy to its production frontier.

3. Owner cultivation helps investment in agriculture in another way as well. Loans are advanced to a farmer, not according to the productive capacity of the farm or of the farmer but according to the security that can be offered by the farmer. An owner cultivator accordingly will be able to draw upon the external sources of finance to a greater extent as compared with a tenant as the land can serve as a good security.
4. Owner cultivation will lead to the use of better available techniques in another way as well. There are certain improved practices in agriculture, e.g., drainage which, though already known, can be adopted only jointly. This joint adoption is easier if the group is a homogenous one. Universal prevalence of owner cultivation according to Dore, by eliminating other tenurial classes, will bring about this homogeneity.
5. Not only is the keenness to invest in the fixed assets higher on the part of an owner cultivator, even his power to invest is likely to be more when compared with that of a tenant. This is because of the fact that whether there is some conflict of interests between the tenants and owners or not, a

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tenant (whether having land on crop sharing basis or on fixed rent) will be having less income because of the payment of rent itself. When compared with an owner, savings of a tenant will accordingly be smaller and so will be the investment in fixed assets (and even in current inputs).

6. Owner cultivation, when compared with tenancy cultivation, not only encourages more use of resources, but also helps in the adoption of an appropriate technique of production. Each holding of land is a category in itself and has certain distinguishing features. The fullest exploitation of these qualities is possible only through a method of trial and error extended over a long period. To which crop the land responds most favourably, which order of crops is the most suitable one so far as rotation of crops is concerned, which fertilizer is the best for the given holding, and what should be the extent of ploughing: one can find answers to all these problems, only after, a long association with the given holding. Obviously, ownership provides the cultivator with such an opportunity. It will encourage the cultivator to evolve the most appropriate technique of cultivation for a given farm.
7. Actually we can go even a step further so far as the use of an appropriate technique is concerned. Even when the tenant is made known the technique best suited to a given piece of land, he may not use it especially when some extra expenditure is needed for the purpose. The tenant may not like to shift to the better technique simply because it is not profitable for him to do so. The additional gain from the change in technique (after the rent in the form of a share of the gross output has been paid) may not be more than the additional cost of the change.
8. We may, also look at the institution of land ownership as an instrument of capital formation in agriculture. Capital used in agriculture obviously can be divided into two categories. One of them is capital in the form of improved current inputs like seeds, fertilizers etc. The other type of capital is in the form of fixed assets like bullocks, machinery, buildings etc. Logically, both tenants as well as owners will have equal keenness to invest in the first category of inputs, if all other things are considered equal. How far the tenant invests in the second category of assets, will depend upon the duration for which he will be getting earnings from a given asset. Obviously, if the land is under an owner, he will be able to earn the rewards from the fixed capital so long as the capital itself lasts. He will accordingly, gladly invest in various durable assets, if he is sure to recover their cost during the life span of these assets. On the other hand, the tenant will be hesitant to invest in fixed capital like buildings or a well, simply because he is not sure to be fully paid off for this investment due to the insecurity of tenure. He may be asked to quit at anytime (unless protected by law) irrespective of the fact whether he has fully recovered the cost of the asset that he has procured specifically for the tenanted farm or not.

9. Production on land under a tenant is likely to suffer in another way also, if the land has been leased out to a tenant on the basis of crop sharing. The owner and the tenant, under a crop sharing agreement, have different attitude towards this type of tenurial arrangement. Whereas the owner wants his rent to be maximized, the tenant wants that whatever his share of earning after the payment of rent, as per agreement is, should be maximized. The two objectives, except in a few cases, will always necessitate a different pattern of resource allocation. These conflicting interests will obviously affect the resource allocation adversely. The tension between the two parties will hinder the optimization of output in many ways.

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### 5.4.2 Case for Tenancy Cultivation

From the previous discussion, one may conclude in favour of an outright grant of ownership to the cultivators. But an unqualified condemnation of the tenancy system which the grant of ownership is meant to replace, will be quite irrational. Tenancy has not always led to a deterioration in productivity or in the conditions of the tenants. L.D. Schweng found that many tenants in Middle East countries were richer than the owner cultivators and this was because of better efficiency of the tenants. Farm management studies in the Punjab have shown that production per acre on certain tenanted farms is higher than the production per acre on self-cultivated farms. In fact, grant of ownership is not a panacea. If in one way, grant of ownership takes the agricultural sector to its production frontier, in another way, it can retard its movement to such a frontier.

1. Tenancy cultivation will prevent the gap between the potential and actual production from widening further, in another way as well. If the farm is treated as property, it is liable to be subdivided when it passes from one generation to another, thus making the cultivation uneconomic and sometime even pushing the land out of cultivation. Such a sub-division can be avoided under a system of tenancy. An alternative solution to tenancy has been suggested (by Gadgil) in this case. Let one of the co-sharers cultivate the land on behalf of the others, the others getting a part of the sale proceeds of crops, after making due allowance for the cost of cultivation as well as for the labour of the cultivating co-sharer. However, this is nothing but another type of tenancy, the only difference being that in this case, tenant is not an outsider, but one of the co-sharers themselves.
2. Share tenancy has also been considered as a useful device for distributing the risk and uncertainty involved in agricultural production, over a larger number of people, i.e. both owners as well as tenants.
3. We know that a complete mobility of various factors of production, including labour is necessary if the production frontier is to be reached. Ownership makes a cultivator stick to given piece of land thus hindering his mobility or for that matter, of the factor, labour. The system of tenancy, on the other

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hand, provides, to some extent, this mobility. The cultivator is not tied to a given piece of the land. He can always move to a farm where his services can be used more profitably.

4. The flow of capital into agriculture and the ownership of land acts as a good security for credit and therefore, will encourage borrowings from external sources for investment in land. Many economists do not agree with this type of argument. According to them, it is not necessary that credit so obtained, must be used; by the farmer for purchasing fixed assets or other agricultural inputs. It can be used for consumption purposes as well. This will be especially so in a community where much is spent on social ceremonies, as has been the case in India. In such a case, production on land does not increase because of the loans so raised. These are used up in meeting consumption expenditure. The land which is pledged with the money lender for these loans ultimately passes to the money lender who generally leases this land out to some tenants. There is sufficient evidence in India to show that much land passes from the owner cultivators to the money lenders in final settlements of the debts owed by the former to the latter. This was the reason that Land Alienation Acts were passed by various provincial governments in India before Independence.
5. The system of tenancy, under certain circumstances, is the only way of achieving the optimum combination of factors of production. If, for example, the capital possessed by a land owner is short, relatively to the land possessed by him, he may borrow more to have an optimum combination. But if, on the other hand, the capital possessed by the land owner is relatively more, specific and indivisible (e.g., a yoke with two bulls which, in general, can easily cultivate 10 to 14 acres of land), the system of tenancy may help him in procuring the additional land necessary for achieving the optimum combination. This is the only way open to the cultivator to achieve the optimum combination of resources if he does not possess sufficient funds to purchase the additional land. Putting it in another way, we can say, that if there are economies of large scale production, sometimes it is the tenancy which may help the community to reap these economies. Tenancy may enable the operator to have larger holdings.
6. Further, permanent attachment to a farm, as is implied by the institution of peasant proprietorship, will also hinder the free movement of agricultural workers from the agricultural sector to the industrial sector and thus will, at some stage, start obstructing the development of the latter. This is what Dandekar feels.
7. Tenancy is helpful in achieving the optimum allocation of resources in another way as well. Sometimes, an owner is temporarily invalid or dies with an heir too young to cultivate the land or dies without an heir interested in cultivation. Under such circumstances, it is only through tenancy that the land which will

otherwise go out of cultivation, will still be productively used. Further misallocation of resources under such circumstances will thus be avoided to a great extent.

As a result of the above discussion, one can easily arrive at the conclusion that it is wrong to say that owner cultivation is always better than the tenant cultivation. There are situations which favour tenancy rather than owner cultivation. Some economists like Martin are of the view that it is hard to generalise about the relative advantages of owner cultivation and tenancy cultivation. In her book *Economics and Agriculture* she has pointed out that the Egyptian system of share tenancy before 1952 was extremely unsatisfactory. Yet this could give the highest yield of cotton per acre. Again in Holland, 50 per cent of land is under tenancy whereas in Denmark, only 5 per cent of the land is cultivated by the tenants. Yet both hold a leading position in agriculture.

Another economist, Schweng, as already pointed out, found tenants in some Middle East countries to be more efficient than the owners. Chakravarty and Rudra (1973) have also found that the tenanted farms were, in no way, differently run when compared with the owner cultivated farms.

Similar is the conclusion arrived at by David Flath about Japanese agriculture. The fact that there is no correlation between the yield and the form of tenurial arrangements is confirmed by Capstic also through a study of some European countries. A recent study by Sharma and others also shows that the resource allocation and productivity is not affected by the tenurial arrangements on the farm.

The foregoing discussion thus leads us to unreservedly support Henry George who said, 'What is necessary for improvement of land is not its private ownership but the security of improvements.' It is not necessary to say to a man 'this land is yours', in order to induce him to cultivate or improve it. It is only necessary to say 'whatever your labour or capital produces on this land, shall be yours'.

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## 5.5 LARGE FARMS VS SMALL FARMS

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Land reforms generally result in the reduction of the size of holdings. Under certain laws, holdings of very small size have been created. This obviously leads us to discuss the relative merits of large farms and small farms. Such a discussion will help us in forming a correct opinion about economic wisdom lying behind land reforms involving ceiling on land holdings.

### 5.5.1 Definition of a Small Farm

Though small farms are a distinguishing feature of agriculture in most of the economies, there has been no unanimity about the definition of a small farm. Different authors have tried to measure the size of a farm according to different criteria. Cohen, for example, suggests the number of workers or value of gross output

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produced, as a measure to classify farms into various size groups. In India, we have never tried to define the small and large farm in terms of number of workers employed or the value of gross output. Indian economists have divided the farms into various categories according to the area of the farms. The difference in the measures used for classification of farms into small and large, in fact, reflects the relative scarcity of various factors involved in agricultural production. In the United States, labour used (a scarce factor) could easily be the basis of division of farms into large or small farms. However, this could not be used as a suitable criterion in India where labour is not a scarce factor. In India, land is the scarcest factor in agriculture. Smallness or largeness of a farm has therefore been determined according to the area of the holdings. For example, following this criterion, Small Farmers Development Agency (SFDA) in some states has considered farms ranging from one hectare to two hectares in size as small farms. (Farms below one hectare in area have been classified as marginal farms.)

### 5.5.2 Economies of Large Farms

(For the discussion that follows, the distinction between large and small farms is based upon the land area of various farms). Theoretically, large farms can reap all the economies of large scale production just like any other large firm. These economies can be as follows:

- (i) **Technical Economies:** A large farm is in a position to take advantage of specialized machinery, buildings, fences, roads, ditches etc. Average cost incurred on these capital assets will become smaller as the size of the farm becomes larger. Not only does the average money cost incurred on these assets fall as the size of farm increases, the land area devoted to the buildings, roads, etc., also becomes relatively smaller as the farm increases in size. On larger farms, thus proportionally more land area becomes available for direct productive use. The overhead cost of production per unit of output will thus fall on large farms. Rotation of crops is another technical advantage available to large farms.

Large farms will help in reducing the per acre operational cost of machinery also through its full utilization. A large farm is also able to try the production of new crops still accompanied by their uncertain productivity because of its huge resources and capacity to undertake risk. Large farms are also necessary for making an optimum use of scarce management and skilled man power.

Further as Bachman and Christensen suggest, quality of products can be easily controlled and the farm output can be properly adjusted to market outlets if the size of the farms is large and as such, their number is small.

- (ii) **Financial Economy:** The other economy that can be reaped by a large farm is the financial economy. A large farmer can borrow easily from an outside source and at a lower rate of interest as compared to the small

farmer. This, in turn, implies that the large farmer can make the best use of favourable opportunities to invest in agriculture whenever these arise. Easy credit can enable him to withhold the sale of output in the market to meet immediate cash needs. This possibility of storage, in turn, will help him to sell his crops at most favourable prices.

- (iii) **Commercial Economies:** These are the other economies which a large farmer can have. Bulk purchase of inputs can result in concessional prices. Bulk sale will reduce the cost of transport per unit to the market. Grading becomes possible if the sale is on a large scale.

### 5.5.3 Limited Advantages of Large Farms

In actual practice, however, the advantages enjoyed by the large farms over the small farms are rather limited. The reasons are as follows:

We may start with the economy concerning the use of machinery. For use of machinery, division of labour is necessary. A process of production should be divided into various sub-processes in such a way that each sub-process (a) involves a uniform movement and (b) is repetitive in nature. For a sub-process involving a uniform and a repetitive movement, machinery can be easily used.

The major agricultural operations as per their nature, cannot be divided into sub-processes involving uniform and repetitive movements. If at all, some division of labour is to be introduced in agriculture, it can only be a broad division of work into major assignment like ploughing, weeding, watering, harvesting etc. As such, as pointed out earlier, machinery cannot be used easily and profitably in agriculture on a large scale.

To elaborate it further, we may point out that agriculture is concerned with living things. These have to be dealt with during the process of their growth as a compact whole. These are not to be treated as consisting of different components which can be separately produced through machines and can, thereafter, be assembled, at the last stage, as it happens in a factory. There is no assembly line in agriculture, as we find in a factory. Machinery can be mainly used only for those processes in agriculture which are concerned either with the pre-sowing (or sowing) operations or harvesting or post harvesting operations.

We may now refer to some other technical economies for which the scale of production is rather neutral. Technological development in agriculture can take three forms, namely: (a) mechanical, (b) biological and (c) chemical. So far as the last two developments are concerned, they can be adopted even on small farms. Size of the farm is no hindrance in the way of using, for example, fertilizers, better seeds, insecticides etc. So the only advantage that the large forms can have is with regard to use of machinery and we have just pointed out that the use of machinery in agriculture is limited.

This, however, should not lead us to conclude that large farms have no economies at all. Other economies like commercial economies or financial

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economies or some of the other technical economies mentioned above do exist for large farms.

#### 5.5.4 Persistence of Small Farms

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Despite the economies which large farms can enjoy, the small farms persist in most of the underdeveloped countries. In the few paragraphs that follow, we shall be discussing the causes of their persistence.

We can classify the causes for the persistence of small farms in agriculture into three groups:

- (i) Causes which hinder the increase in the size of the farm,
- (ii) Causes which create small farms, and
- (iii) Causes which favour small farms (Economics of small farms).

**(a) Hindrances to the increase in the Size of Farms:** In this section, we shall discuss some factors that do not allow a particular farm to increase in size.

**Technical Difficulties:** In the first instance, an increase in the size of the farm, in fact, necessitates an expansion of various farm buildings which might have been built, keeping in view the existing size of the farm. Addition to these farm buildings may be a costly affair.

Again, expansion of a farm obviously needs additional land from the neighbouring farms. This may not be available as the neighbouring farms may not be divisible. No contiguous land may be available.

**Financial Difficulties:** Both long term as well as short term finance is needed for increasing the size of the farm. This finance may not be available with the farmer himself. As such, he may have to depend upon some external source of finance. But the smallness of the farm itself will dissuade the potential lenders from extending any financial aid to him for purchasing additional land. Even if he is able to raise some loans for the purpose, the rate of interest that he will have to pay on such loans will be rather high due to relatively greater uncertainty in agriculture.

**(b) Factors responsible for Creating Small Farms:** Various historical reasons are responsible for the creation of small farms in different economies. Increasing population pressure, laws of inheritance requiring equal distribution of landed property among all inheritors (including daughters), break up of joint family system, parcelling away of a part of the farm to the money lender in final settlement of debt decline of handicrafts etc., have been some factors responsible for exceedingly small farms in countries like India. Moreover, in most of the societies, agriculture is not only an occupation, it is also a way of life. Possession of land and its cultivation has thus become a social necessity for many. In some societies, ownership of land is also considered a status symbol. Many of these factors have been in operation



in quite a number of countries in this part of the world. Once the farms decline in size, it becomes rather difficult for them to become large because of the aforementioned difficulties.

(c) **Factors favouring Small Farms:** Small farms are not the creation of time only. They have certain advantages too, on their side. These advantages are as follows:

(i) **Greater Employment of Small Farms:** Small farms use labour intensive techniques, rather than the capital intensive techniques as is generally the case on large farms. This will obviously lead to a greater demand for labour and therefore, more employment opportunities on small farms. Greater intensity of cultivation on small farms is another reason for more employment on these farms.

(ii) **Farming is not a simple occupation:** It requires not only hard work but also care and attention. As World Bank has pointed out, quality of farming can never be ignored. Small farms always have favourably affected the quality of work. Small farmer's (and his family's) motivation is usually strong when he is growing food to feed his family.

(iii) **Tenacity of Small Farms:** Small farms generally depend upon family labour. Family labour is very flexible in supply. It can cope with various fluctuations in the required quantity of work, arising out of changing weather and unpredictable needs of crops and livestock. According to Heady, 'In the absolute sense, the range over which incomes vary between high profit and loss periods is greater for the farm with large capital than for small units'. One can 'make or break' himself easier on a large farm than on a small farm.

Yet another form of stability is experienced on a small farm. The small farmers, in general, neither sell any surplus produce in the market, nor do they purchase any input from the market. They are, thus completely off the market. Therefore, any adverse change in the agricultural prices, does not affect resource allocation on their farms.

(iv) **Effective Supervision:** Supervision is very easy in a large factory. Workers are working under the same roof and a few foremen can effectively supervise the workers working under one roof. Agricultural operations, on the other hand, are scattered over a vast area and the owner can supervise his workers only when they are working in his close vicinity. This, in other words, implies that the size of the farms should not be very large.

(v) **Agriculture is Generally a Family Proposition:** This implies that with every generation, the policy about farm equipment to be used, the products to be produced, (crops or dairy products etc.) can be different. If this policy is to change from generation to generation, large scale farming organizations will be discouraged.

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**(vi) Need for Spot Decisions:** Agriculture does not need routine types of decisions. Rather, fresh and immediate decisions have to be taken every day in view of the ever changing physical factors affecting production.

Such decisions can be taken only by the farmer himself. He cannot create a salaried class of managers to take these decisions. His association with the decision making process, at every stage, is a must and this would necessitate that the size of the farm should not become too large.

**(vii)** It is also pointed out that small farms act like a first rung of the ladder for the landless agricultural workers to become farmers. Financial difficulties as well as managerial limitations will not permit landless agricultural workers to own and operate big farms. In other words, for maintaining dynamism in the agricultural occupation, small farms act as the starting point. Mellor puts this advantage of the small farms in other words. According to him, small farms are required 'to provide the economic incentive to get careful management, intensive use of scarce land resources and development of human abilities.'

**(viii) Higher per Acre Yield on Small Farms:** Ervin Long has defended small farms on the basis of certain farm management studies conducted in some underdeveloped countries. It was found that output per acre was higher on small farms than on large farms. This was mainly because the small farms were cultivated more intensively. (It may, however, be noted that this tendency will be visible only when the technique of production is the same on both types of farms and is generally labour intensive).

### Check Your Progress

5. Name the three forms of technological development that can take place in agriculture.
6. Mention the advantages of using small farms.

## 5.6 LAND REFORMS AND STATUS OF AGRICULTURE

Department of Agriculture and Cooperation under the Ministry of Agriculture is the nodal organization responsible for the development of agricultural sector. It is responsible for the formulation and implementation of national policies and programmes aimed at achieving rapid agricultural growth through optimum utilization of land, water, soil and plant resources of the country.

Some of the significant initiatives taken by the government in recent years are Rashtriya Krishi Vikas Yojana, National Policy For Farmers, Expansion of

Institutional Credit to Farmers, National Food Security Mission, Integrated Food Law, Legislative Framework for Warehousing Development and Regulation, Protection of Plant Varieties and Farmers' Rights Act (2001) and National Bamboo Mission.

Land Holding Pattern  
and Land Reforms

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As per the Annual Report of the Department of Agriculture, Cooperation and Farmer's Welfare (2019-20), as per the Land Use Statistics 2014-15, the total geographical area of the country is 328.7 million hectares, of which 140.1 million hectares is the reported net sown area and 198.4 million hectares is the gross cropped area with a cropping intensity of 142%. The net area sown works out to 43% of the total geographical area. The net irrigated area is 68.4 million hectares.

**Table 5.5 Total Agricultural Land Use in India (1951-2015)**

S.No.	Classification	1950-51	1990-91	2000-01	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
I.	<b>Geographical Area</b>	<b>328.73</b>	<b>328.73</b>	<b>328.73</b>	<b>328.73</b>	<b>328.73</b>	<b>328.73</b>	<b>328.73</b>	<b>328.73</b>	<b>328.73</b>
II.	<b>Reporting Area for Land Utilisation Statistics</b>	<b>284.32</b>	<b>304.86</b>	<b>305.19</b>	<b>307.41</b>	<b>307.48</b>	<b>307.39</b>	<b>307.49</b>	<b>307.80</b>	<b>307.82</b>
1.	Forest	40.48	67.81	69.84	71.56	71.59	71.60	71.57	71.83	71.79
2.	Not Available for Cultivation (A+B)	47.52	40.48	41.23	43.33	43.58	43.53	43.58	43.86	43.88
	(A) Area Under Non-agricultural Uses	9.36	21.09	23.75	26.16	26.40	26.31	26.50	26.91	26.88
	(B) Barren & Un-culturable Land	38.16	19.39	17.48	17.18	17.18	17.22	17.07	16.95	17.00
3.	Other Uncultivated land excluding Fallow	49.45	30.22	27.74	26.50	26.15	26.11	26.08	25.83	25.83
	(A) Permanent Pasture & other Grazing Land	6.68	11.40	10.66	10.34	10.30	10.31	10.26	10.26	10.26
	(B) Land under Miscellaneous Tree Crops & (C) Culturable Waste Land	19.83	3.82	3.44	3.21	3.20	3.16	3.18	3.19	3.10
4.	Fallow Lands (A+B)	22.94	15.00	13.63	12.95	12.65	12.64	12.64	12.39	12.47
	(A) Fallow Lands other than Current Fallows	28.12	23.37	25.04	26.85	24.60	25.18	26.32	24.85	26.18
	(B) Current Fallows	17.45	9.66	10.27	10.84	10.32	10.67	11.04	10.69	11.09
5.	Net Area Sown (6-7)	10.68	13.70	14.78	16.01	14.29	14.51	15.29	14.15	15.09
6.	Total Cropped Area (Gross Cropped Area)	118.75	143.00	141.34	139.17	141.56	140.98	139.94	141.43	140.13
7.	Area Sown more than once	131.89	185.74	185.34	189.19	197.68	195.80	194.25	200.95	198.36
8.	Cropping Intensity*	13.15	42.74	44.00	50.02	56.12	54.82	54.31	59.52	58.23
	Net Irrigated Area	111.07	129.89	131.13	135.94	139.64	138.88	138.81	142.09	141.55
	Gross Irrigated Area	20.85	48.02	55.20	61.94	63.67	65.71	66.29	68.12	68.38
		22.56	63.20	76.19	85.09	88.94	91.79	92.25	95.77	96.46

\* Cropping Intensity is percentage of Gross Cropped Area to Net Area Sown.

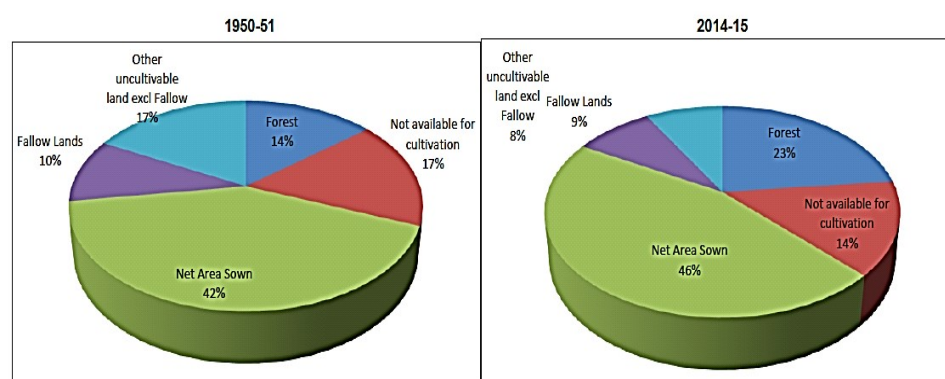
(P) Provisional

Notes:

1. In 2009-10 there is significant decline in Total Cropped Area and Net Area Sown due to decline in net area sown in the states of Andhra Pradesh, Bihar, Jharkhand, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal. This was mainly due to deficient rainfall.

Source: Land-Use Statistics 2014-15, Directorate of Economics & Statistics, DAC&FW

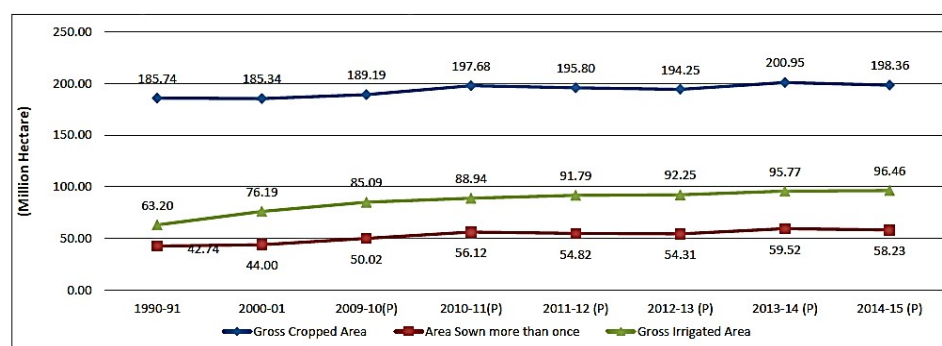
**Source:** Pocket Book of Agricultural Statistics 2017



**Source:** Pocket Book of Agricultural Statistics 2017

**Fig 5.1 Agriculture Land Use in India 1950 vs 2015**

## NOTES



**Source:** Pocket Book of Agricultural Statistics 2017

**Fig 5.2** Changes in Gross Cropped and Gross Irrigated Areas

Some initiatives taken by the government for agricultural development are as follows:

- Bharat Nirman
- National Rural Employment Guarantee Programme (MGNREGP presently)
- National Horticulture Mission
- Expansion of Institutional Credit to Farmers
- Establishment of the National Bee Board
- Establishment of the National Rainfed Area Authority
- Establishment of the National Fisheries Development Board
- Watershed Development and Micro Irrigation Programmes
- Reforms in Agricultural Marketing and Development of Market Infrastructure
- Revitalization of Cooperative Sector
- Reform and Support for Agriculture Extension Services
- National Rural Health Mission
- Knowledge connectivity through Common Service Centres (CSC) and IT initiatives.

Rashtriya Krishi Vikas Yojana, National Food Security Mission and National Policy for Farmers, 2007 are some of the most popular initiatives by the government. These are explained as follows:

### **Rashtriya Krishi Vikas Yojana (RKVY)**

It was launched by the Government of India during 2007-08 to incentivize the states to increase the share of investment in agriculture in their state plans. It was aimed at achieving 4 per cent annual growth in agricultural sector during the Eleventh Five Year Plan by ensuring a holistic development of agriculture and allied sectors. It is a State Plan Scheme and the eligibility for assistance under the scheme depends on the amount provided in the state budgets for agriculture

and allied sectors, over and above the baseline percentage expenditure incurred on agriculture and allied sectors. Funds under the RKVY are to be provided by the central government to the states as 100 per cent grant. The main objectives of the scheme are as follows:

- To incentivize the states to increase public investment in agriculture and allied sectors
- To provide flexibility and autonomy to the states in planning and executing agriculture and allied sector schemes
- To ensure the preparation of plans for the states based on agro-climatic conditions, availability of technology and natural resources
- To ensure that the local needs/crops/priorities are better reflected in the agricultural plans of the states
- To achieve the goal of reducing the yield gaps in important crops, through focused interventions
- To maximize returns to the farmers in agriculture and allied sectors
- To bring about quantifiable changes in the production and productivity of various components of agriculture and allied sectors by addressing them in a holistic manner

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### **National Food Security Mission (NFSM)**

It is a centrally-sponsored scheme, launched in 2007 with the objective of increasing the production of rice, wheat and pulses by 10, 8 and 2 million tonnes, respectively, over the benchmark levels of production, by the end of the Eleventh Five Year Plan period. The

Mission aims at increasing food grains production of the above crops through area expansion and productivity enhancement; restoring soil fertility and productivity; creating employment opportunities; and enhancing farm level economy to restore confidence of farmers of targeted districts. It is being implemented in 305 districts of 16 states of the country.

Various activities of NFSM relate to demonstration of improved production technology, distribution of quality seeds of HYV (High Yielding Variety) and hybrids, popularization of newly released varieties, support for micronutrients, and training and mass media campaign including awards for best performing districts. The identified districts are given flexibility to adopt any local area specific interventions as included in the Strategic Research and Extension Plan (SREP) prepared for the agriculture development of the district.

### **National Policy for Farmers, 2007**

The Government of India had approved the National Policy for Farmers 2007 taking into account the recommendations of the National Commission on Farmers and after consulting the state governments. The National Policy for Farmers, among

## NOTES

other things, has provided a holistic approach for the development of agricultural sector.

The primary focus of this policy is on the ‘farmer’, defined holistically and not merely on agriculture. In that sense, it is much more comprehensive than an Agriculture Policy. The objective is, inter alia, to improve the economic viability of farming through substantially improving net income of farmers. Needless to say, there is emphasis on increased productivity, profitability, institutional support, and improvement of land, water and support services apart from provisions of appropriate price policy, risk mitigation measures and so on. The major goals of the National Policy for Farmers are to:

- Improve economic viability of farming by substantially increasing the net income of farmers and to ensure that agricultural progress is measured by advances made in this income
- Protect and improve land, water, bio-diversity and genetic resources essential for sustained increase in the productivity, profitability and stability of major farming systems by creating an economic stake in conservation
- Develop support services including provision for seeds, irrigation, power, machinery and implements, fertilizers and credit at affordable prices in adequate quantity for farmers
- Strengthen the bio-security of crops, farm animals, fish and forest trees for safeguarding the livelihood and income security of farmer families and the health and trade security of the nation
- Provide appropriate price and trade policy mechanisms to enhance farmers’ income
- Provide for suitable risk management measures for adequate and timely compensation to farmers
- Complete the unfinished agenda in land reforms and to initiate comprehensive asset and Aquarian reforms
- Mainstream the human and gender dimension in all farm policies and programmes
- Pay explicit attention to sustainable rural livelihoods
- Foster community-centred food, water and energy security systems in rural India and to ensure nutrition security at the level of every child, woman and man
- Introduce measures which can help attract and retain youths in farming and processing of farm products for higher value addition by making it intellectually stimulating and economically rewarding
- Make India a global outsourcing hub in the production and supply of the inputs needed for sustainable agriculture, products and processes developed through biotechnology and Information and Communication Technology (ICT)

- Restructure the agricultural curriculum and pedagogic methodologies for enabling every farm and home science graduate to become an entrepreneur and to make agricultural education gender sensitive
- Develop and introduce a social security system for farmers
- Provide appropriate opportunities and adequate measure for non-farm employment for the farm households

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### **Agricultural Policies: Impact on Production, Rural Employment and Income Distribution**

Although Indian agriculture has come a long way, there are certain implications that have to be addressed for national and nutritional security. Our population is expected to be 1.4 billion by 2020. The increasing population, coupled with growing income will generate increased demand for food grains and non-foodgrain crops. Therefore, Indian agriculture has to achieve a higher growth rate targeted at 4 per cent per annum on a sustainable basis. The Department of Agriculture and Cooperation is working on strategies to achieve this growth rate.

New initiatives like RKVY and NFSM have helped in improving agricultural sector. While public investment in agriculture has not kept pace with the requirements of the sector, food and fertilizer subsidies have supported this sector to a great extent. The technological improvements in Indian agriculture since mid sixties have brought about revolutionary increase in agricultural production. Interestingly, the growth rate of food grain production particularly in the case of wheat and rice was much higher than the growth rate of population. India was facing acute food shortages till the eighties but now it has become not only self-sufficient but also a net exporter of food grains. This could happen due to the evolution of high yielding crop varieties, increased use of chemical fertilizers, development of irrigation facilities, plant protection measures and effective price support programmes of farm products.

Farm mechanization, the process of using agricultural machinery to mechanize the work of agriculture, has been helpful in bringing about a significant improvement in agricultural productivity. The timeliness achieved through farm mechanization helped in obtaining optimal yields from different crops. For instance, the sowing of wheat in Punjab needs to be done by the first fortnight of November. A delay beyond this period even by one week leads to about 1.50 quintals per acre decrease in the yield. This is also correct in the case of other crops and for other farm operations like hoeing, irrigation, harvesting, threshing and marketing which need to be performed at appropriate time otherwise the yield and farm income is affected adversely.

Farm mechanization also helped in improving the quality and precision of the operations such as land leveling, irrigation, sowing and planting, use of fertilizers, plant protection, harvesting and threshing. The Pradhan Mantri Gram Sadak Yojana (PMGSY) has helped in extending rural connectivity.

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As a result of these strategies, foodgrains output increased substantially from 81.0 million tones in the Third Plan (annual average) to 203 million tones in the Ninth Plan (annual average) and further to 208.3 million tones in 2005-06. As per second advance estimates, foodgrain production stands at 291.95 million tonnes for the year 2019-20.

**Table 5.5** All-India Area, Production and Yield of Foodgrains  
Alongwith Coverage under Irrigation

			Area - Million Hectares Production - Million Tonnes Yield - Kg./Hectare	
Year	Area	Production	Yield	Area Under Irrigation(%)
1	2	3	4	5
1950-51	97.32	50.82	522	18.1
1951-52	96.96	51.99	536	18.4
1952-53	102.09	59.20	580	18.1
1953-54	109.07	69.82	640	18.1
1954-55	107.86	68.03	631	18.4
1955-56	110.56	66.85	605	18.5
1956-57	111.14	69.86	629	18.2
1957-58	109.48	64.31	587	19.3
1958-59	114.76	77.14	672	18.7
1959-60	115.82	76.67	662	18.8
1960-61	115.58	82.02	710	19.1
1961-62	117.23	82.71	706	19.1
1962-63	117.84	80.15	680	19.8
1963-64	117.42	80.64	687	19.8
1964-65	118.11	89.36	757	20.2
1965-66	115.10	72.35	629	20.9
1966-67	115.30	74.23	644	22.2
1967-68	121.42	95.05	783	21.6
1968-69	120.43	94.01	781	23.6
1969-70	123.57	99.50	805	23.7
1970-71	124.32	108.42	872	24.1
1971-72	122.62	105.17	858	24.5
1972-73	119.28	97.03	813	25.4
1973-74	126.54	104.67	827	24.5
1974-75	121.08	99.83	824	26.5
1975-76	128.18	121.03	944	26.5
1976-77	124.36	111.17	894	27.4
1977-78	127.52	126.41	991	27.7
1978-79	129.01	131.90	1022	28.8
1979-80	125.21	109.70	876	30.3
1980-81	126.67	129.59	1023	29.7
1981-82	129.14	133.30	1032	29.6
1982-83	125.10	129.52	1035	30.8
1983-84	131.16	152.37	1162	30.9
1984-85	126.67	145.54	1149	31.9
1985-86	128.02	150.44	1175	31.4
1986-87	127.20	143.42	1128	32.6
1987-88	119.69	140.35	1173	33.5
1988-89	127.67	169.92	1331	34.4
1989-90	126.77	171.04	1349	35.0
1990-91	127.84	176.39	1380	35.1



1991-92	121.87	168.38	1382	37.4
1992-93	123.15	179.48	1457	37.4
1993-94	122.75	184.26	1501	38.7
1994-95	123.86	191.50	1546	39.6
1995-96	121.01	180.42	1491	40.1
1996-97	123.58	199.44	1614	40.0
1997-98	123.85	192.26	1552	40.8
1998-99	125.17	203.61	1627	42.4
1999-00	123.10	209.80	1704	43.9
2000-01	121.05	196.81	1626	43.4
2001-02	122.78	212.85	1734	43.0
2002-03	113.86	174.77	1535	42.8
2003-04	123.45	213.19	1727	42.2
2004-05	120.00	198.36	1652	44.2
2005-06	121.60	208.60	1715	45.5
2006-07	123.71	217.28	1756	46.3
2007-08	124.07	230.78	1860	46.8
2008-09	122.83	234.47	1909	48.3
2009-10	121.33	218.11	1798	NA
2010-11*	125.73	241.57	1921	NA
2011-12**	70.49	123.88	1757	NA

\* Fourth Advance Estimates as released on 19.07.2011.  
 \*\*First Advance Estimates released on 14.09.2011.  
 Note: The yield rates given above have been worked out on the basis of production & area figures taken in '000 units.  
 Source: Directorate of Economics and Statistics, Department of Agriculture and Cooperation

## NOTES

A number of people believe that use of technology leads to unemployment. However, an in-depth study shows that it is not so. Many agriculturalists assert that tractors may displace labour at the time of sowing but increase in production due to the use of tractors would lead to greater demand for labour for harvesting as well as for other agricultural operations. The use of technology increases the demand for multiple cropping, irrigation facilities, and use of fertilizers and pesticides. All these factors in the last few years have helped in creating more employment opportunities in rural areas.

Though agricultural sector improved in the last few years, yet there is a lot of scope for growth in this sector even now.

### Check Your Progress

7. Mention some of the popular initiatives taken by the government for agricultural development.
8. What are the various activities covered under the National Food Security Mission (NFSM)?

## 5.7 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. The types of land holdings are the following:
  - Economic holding
  - Basic holding

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- Optimum holding
  - Family holding
2. Two limitations of land fragmentation are the following:
- (i) **Land Wastage:** Due to the sub-division of land, boundary area has no use. Therefore, this area becomes unfit for cultivation. Further, due to fragmentation of land production also depreciates.
  - (ii) **Management Difficulties:** Land fragmentation results in wastage of time and resources because inputs like seeds have to be transported to a different field which increases the cost as well as leads to wastage of time and other resources.
3. Since Independence, the objectives of the Land Reforms Policy have been as follows:
- Restructuring agrarian relations to achieve an egalitarian social structure
  - Removing impediments that arise from the agrarian structure inherited from the past
  - Eliminating exploitation in land relations
  - Increasing agricultural production
  - Regulation of the rent of agricultural land
  - Security of tenure and conferment of ownership rights on tenants
4. Several reasons have led to the need for land reforms in India since Independence. The prominent reasons are the following:
- Land records were in extremely bad shape and there was skewed data available
  - There was a presence of a lot of unnecessary middlemen and intermediaries
  - There was a requirement for tenancy reforms to curb exploitive rent
  - There was no security of tenure for the tenants
  - There was a need to abolish the culture of landlordism and their exploitation through bonded labour
  - There was wide disparity in land holding and vast lands were concentrated in the hands of few.
5. Technological development in agriculture can take three forms, namely: (a) mechanical, (b) biological and (c) chemical.
6. Small farms have certain advantages too, on their side. These advantages are as follows:
- Greater Employment of Small Farms
  - Tenacity of small farms

- Effective supervision
  - Higher per acre yield on small farms
7. Some other initiatives taken by the government for agricultural development are as follows:
- Bharat Nirman
  - National Rural Employment Guarantee Programme (MGNREG presently)
  - National Horticulture Mission
  - Expansion of Institutional Credit to Farmers
  - Establishment of the National Bee Board
  - Establishment of the National Rainfed Area Authority
  - Establishment of the National Fisheries Development Board
  - Watershed Development and Micro Irrigation Programmes
  - Reforms in Agricultural Marketing and Development of Market Infrastructure
  - Revitalization of Cooperative Sector
  - Reform and Support for Agriculture Extension Services
  - National Rural Health Mission
  - Knowledge connectivity through Common Service Centres (CSC) and IT initiatives.
8. The various activities of NFSM relate to demonstration of improved production technology, distribution of quality seeds of HYV (High Yielding Variety) and hybrids, popularization of newly released varieties, support for micronutrients, and training and mass media campaign including awards for best performing districts. The identified districts are given flexibility to adopt any local area specific interventions as included in the Strategic Research and Extension Plan (SREP) prepared for the agriculture development of the district.

## NOTES

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### 5.8 SUMMARY

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- The term land holding or agriculture holding indicates the average size of agricultural land held by the farmer in India.
- Due to the sub-division of land, boundary area has no use. Therefore, this area becomes unfit for cultivation. Further, due to fragmentation of land production also depreciates.
- Land reforms refer to all those reforms which are concerned with land ownership, land holdings and landlord-tenant relationship.

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- Land reform continues to be a state subject but the central government provides a framework for the enactments of land reform measures.
- Since land reform is a state subject, the central government's role is restricted to formulating general directions and persuading the state governments to implement them.
- Perhaps the oldest efforts of systematic land measurement in the Indian subcontinent can be traced to the time of Akbar and Todar Mal. Later, with the advent of the British, the land administration was solely concentrated on extracting tax and revenues from the land and not the improvement of productivity of the land or the regulations for people associated with it.
- Owner cultivation helps investment in agriculture in another way as well. Loans are advanced to a farmer, not according to the productive capacity of the farm or of the farmer but according to the security that can be offered by the farmer
- Land reforms generally result in the reduction of the size of holdings. Under certain laws, holdings of very small size have been created. This obviously leads us to discuss the relative merits of large farms and small farms.
- A large farm is in a position to take advantage of specialised machinery, buildings, fences, roads, ditches etc. Average cost incurred on these capital assets will become smaller as the size of the farm becomes larger.
- Department of Agriculture and Cooperation under the Ministry of Agriculture is the nodal organization responsible for the development of agricultural sector. It is responsible for the formulation and implementation of national policies and programmes aimed at achieving rapid agricultural growth through optimum utilization of land, water, soil and plant resources of the country.
- The Government of India has approved the National Policy for Farmers 2007 taking into account the recommendations of the National Commission on Farmers and after consulting the state governments. The National Policy for Farmers, among other things, has provided a holistic approach for the development of agricultural sector.
- Although Indian agriculture has come a long way, there are certain implications that have to be addressed for national and nutritional security. Our population is expected to be 1.4 billion by 2020.
- A number of people believe that use of technology leads to unemployment. However, an in-depth study shows that it is not so. Many agriculturalists assert that tractors may displace labour at the time of sowing but increase in production due to the use of tractors would lead to greater demand for labour for harvesting as well as for other agricultural operations.

## 5.9 KEY WORDS

- **Land reforms:** These refer to all those reforms which are concerned with land ownership, land holdings and landlord-tenant relationship.
- **Benami land:** This refers to land held under a different name to circumvent the law.
- **Farm mechanization:** It is the process of using agricultural machinery to mechanize the work of agriculture.

## NOTES

## 5.10 SELF ASSESSMENT QUESTIONS AND EXERCISES

### Short-Answer Questions

1. What do you understand by the term 'land holding pattern'?
2. Briefly mention the causes of land fragmentation in India.
3. Write a short note on the economies of large farms.
4. List the advantages of large farms.

### Long-Answer Questions

1. Discuss the policies adopted in the various Five Year Plans with special reference to land reforms in India.
2. Explain the advantages of ownership of land.
3. Critically examine the impact of land reforms in India.

## 5.11 FURTHER READINGS

- Hanumantha Rao, C.H. 1965. *Agricultural Production Function, Costs and Returns in India*. Mumbai: Tata McGraw Hill.
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## UNIT 6 FARMING SYSTEM

### NOTES

#### Structure

- 6.0 Introduction
- 6.1 Objectives
- 6.2 System of Farming
  - 6.2.1 Farm Management Analysis
- 6.3 Farm Organizations
  - 6.3.1 Peasant Family Farming
  - 6.3.2 Capitalistic Farming
  - 6.3.3 State Farming
  - 6.3.4 Collective Farming
  - 6.3.5 Cooperative Farming
- 6.4 Cost Concepts and Profit Maximization
- 6.5 Measures of Farm Efficiency
- 6.6 Supply Response in Agriculture
- 6.7 Farm Size and Productivity Debate
- 6.8 Answers to Check Your Progress Questions
- 6.9 Summary
- 6.10 Key Words
- 6.11 Self Assessment Questions and Exercises
- 6.12 Further Readings

### 6.0 INTRODUCTION

In this unit, you will learn about the different tools of farm management. Management of a farm covers various aspects of farm business, which have a bearing on the economic efficiency of the farm. It seeks to help the farmer in deciding what to produce, how much to produce, how to produce and when to buy and sell. It also covers organizational and managerial problems related to these decisions. The different tools of farm management are production function, farm planning, budgeting and linear programming.

Farm planning is fundamental to the management process, because it is the main source of all other management activities. The objectives of profit maximization or cost minimization in farming can be achieved through different methods of farm management analysis. Budgeting and linear programming are two such methods which enable a farmer to achieve these objectives. To achieve optimum utilization of resources, it is practically mandatory to have knowledge about the nature of the production function. The use of a statistically fit production function is a must for empirical analysis.

There are many types of farming organizations in different parts of the world, such as peasant farming organizations, capitalist farming organizations and shared tenant farming organizations. All of these are discussed in detail in this unit.

## 6.1 OBJECTIVES

After going through this unit, you will be able to:

- Explain the concept of farm management
- Examine the different farm organizations
- Discuss cost concepts derived from the production that are used in economic analysis
- Discuss the relationship between farm size and productivity

## NOTES

## 6.2 SYSTEM OF FARMING

The term farm management comprises two words ‘farm’ and ‘management’. Farm basically includes every type of land on which some agricultural operations are performed by a person, either through his own labour or through the assistance of members of his household or hired employees. Management, on the other hand, means the act or art of managing. Thus, farm management may be defined as a process of managing farming activities to accomplish the desired objectives.

Different authors have defined farm management as the art of applying business and scientific principles to the organization and operation of a farm. H.C. Taylor, the first professor of agricultural economics at Wisconsin University (US) and the first chief of the Bureau of Agricultural Economics in the US Department of Agriculture, says that farm management is literally the art of managing a farm. L.C. Gray states that the art of managing a farm successfully, as measured by the test of profitableness, is called farm management. Farm management has also been defined as ‘a science dealing with the combination and operation of production factors, including land, labour, capital and selection of the kind and quantity of crops and livestock’. This will provide maximum and continuous returns to the farm unit.’ G.F. Warren describes farm management as a science of the organization and management of farm enterprises for the purpose of securing maximum continuous profit. L.A. Moorhouse defines farm management as the study of the business phase of farming. According to C.L. Holmes, farm management is a study of the principles underlying the functioning of a farmer as a business proprietor.

### 6.2.1 Farm Management Analysis

There are four main tools of farm management. These are as follows:

1. Production functions
2. Farm planning
3. Budgeting
4. Linear programming

Each tool is explained briefly as follows:

### 1. Production functions

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It has been repeatedly emphasized that for optimum resource allocation, we have to make use of one or more production functions. This is however based on theory. Practically speaking, unless we have knowledge about the nature of the production function, we cannot know the point which will indicate the optimum utilization of resources. We know that the equality of the marginal value productivity of a factor with its price is the general condition, necessary for its optimum use. But the main question is, how to determine the marginal value productivities of various factors or the direction in which these marginal value productivities move under different factors. A production function needs to be fitted into the given data. The first important question that arises in this regard is the nature of the production function. The production function that is fitted and utilized for further empirical analysis needs to be statically fit. This assertion in turn, leads to another problem. We must know about various production formations that can be fitted to the given data. We see some important production functions that have been or can be used for analyzing problems of resources used in agriculture.

#### (i) Homogeneous production function

A homogeneous production function is characterized by a factor of multiplicative scaling. It means that if an argument is multiplied by a factor, then the result too is multiplied by some power of the factor.

Let us take an instance of the following production function:

$$X_0 = f(L, K)$$

We increase both factors of this function by the same proportion, such that the resulting new level of output  $X^*$  is given by

$$X^* = f(a^L, a^K)$$

If 'a' can be factored out, the new level of output  $X^*$  can be expressed as a function of a (to any power w).

$$X^* = a^w f(L, K)$$

$$X^* = a^w X_0 \dots \text{since } X_0 = f(L, K)$$

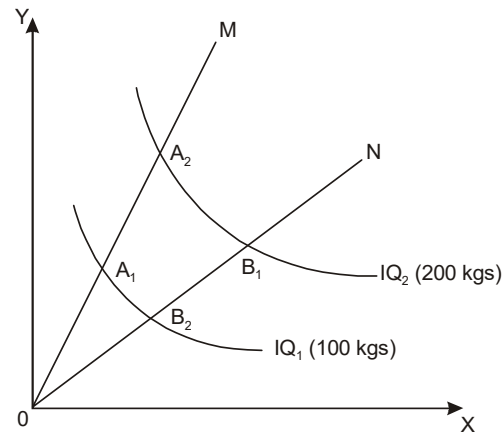
This kind of production function is known as homogeneous. In a case where 'a' cannot be factored out, the production function is known as non-homogeneous. In a more general form, a homogeneous production function can be expressed as:

$$Ym^k = (mx, my)$$

Where m is any real number and k is constant. This function is homogeneous of degree K. If K is equal to 1, then the function becomes homogeneous of degree 1. If K is equal to 2, then the function becomes homogeneous of the degree 2 and yields increasing returns to scale. If, on the other hand K is less than 1, the function



yields diminishing returns to scale. It may be noted that if the production function is linear and homogeneous, all isoquants would be exactly similar in shape, as shown in Figure 6.1 and expansion path of the farm – firm would be a straight line, through the origin.



**Fig. 6.1** Linear Homogeneous Production Function

In Figure 6.1,  $IQ_2$  is simply a magnified version of  $IQ_1$  showing double the output. A straight line, OM, is drawn from the origin and intersects the isoquants  $IQ_1$  and  $IQ_2$  at points  $A_1$  and  $A_2$  respectively. In a linear homogeneous production function, the slope of the curve  $IQ_1$  at  $A_1$  must be equal to the slope of the curve  $IQ_2$ , at point  $A_2$ . In this sense the curves must be parallel, when seen from the origin.

### Properties of linear homogeneous production functions

A linear homogeneous production function has the following properties:

- (a) If we are using two inputs, capital and labour, then the average product of either input depends upon the proportion in which inputs are combined.

Suppose  $Q = (L, K)$  is a linear homogeneous function. Multiplying each variable function by  $I/L$ , we get:

$$Q/L = f, 1 \left( \frac{L}{L} \right) \left( \frac{K}{L} \right)$$

Whereas  $Q/L$  is the average product of labour:

$$\text{So, } AP_L = f(1, K/L) = f\left(\frac{K}{L}\right)$$

Thus, we prove that average product of labour depends on the capital-labour ratio.

Similarly, multiply  $Q = f(L, K)$  by  $I/K$

We get  $Q/K = f(L/K, K/K) = Q/K = f(L/K, 1)$

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$$\begin{aligned}\text{So } AP_k &= f(L/K, I) \\ &= f(L/K)\end{aligned}$$

That means that average product of capital depends on the capital-labour ratio alone.

- (b) The partial derivatives  $\frac{\partial R}{\partial Q}$  and  $\frac{\partial Q}{\partial R}$  (Marginal Product of either input) are functions of the ratio of capital to labour (K/L).

Thus, we have:

$$QL = f(K/L)$$

Multiply the above equation by L, we have:

$$Q = LF(K/L)$$

Partially differentiating the above expression to L, we get

$$\begin{aligned}dQ &= d/dL [LF(K/L)] \\ &= F(K/L) + LF'(K/L) \\ &= F(K/L) + LF'(K/L)(-KL^{-2})\end{aligned}$$

$$\begin{aligned}\frac{\partial Q}{\partial L} &= F(K/L) - LF'(K/L) \times \frac{K}{L^2} \\ &= F(K/L) - K/L F'(K/L)\end{aligned}$$

Similarly, we can prove that  $dQ/dK = F'(K/L)$

Hence, the expressions so obtained for  $Dx/dL$  and  $dx/dK$  reveal that both are functions of the variable (K/L), i.e., the ratio of capital to labour.

- (c) If a production function is homogeneous of degree 1, the marginal productivities of labour and capital are homogeneous of degree 0, i.e., they remain unchanged for proportionate change of both the inputs.
- (d) The linear homogeneous production function satisfies the Euler's Theorem, which states that the total product is completely exhausted by the sum of factor payments, that is  $\frac{\partial Q}{\partial L}L + \frac{\partial Q}{\partial K}K = Q$ .

From this, we know that:

$$dQ/dL = F'(KL) - (K/L) F'(K/L) \text{ and } dQ/dK = F'(K/L)$$

If we substitute these in above equation, we get:

$$L F(K/L) - (K/L) F'(K/L) + F'(K/L) K = Q$$

$$L F(K/L) - K/F(K/L) + Kp'(K/L) = Q$$

$$ZF(K/L) = Q$$

$$F(K, L) = X$$

Hence proved.

Irrespective of the value of L and K, Euler's theorem will hold because,  $L \frac{dQ}{dL} + K \frac{dQ}{dK} = x$  is an identity.

### (ii) Cobb-Douglas production function

The Cobb-Douglas production function is based on the empirical study of the American manufacturing industry undertaken by Paul H. Douglas and C.W. Cobb. It is a linear homogeneous production function of degree 1. It takes into account only two input factors: labour and capital, for the entire output of the manufacturing industry. The Cobb-Douglas production function assumes that the logarithm of the total output of the economy is a linear function of the logarithms of the labour force and the capital stock:

$$\log Q = \log a + p \log L + q \log C,$$

This can also be written as:

$$Q = a L^p C^q$$

Where Q is the output, L the quantity of labour employed, C is the quantity of capital employed and 'p' and 'a' are positive constants ( $p < 1$ ).

This is a homogeneous linear production function, which implies constant returns to scale, when

$$p + q = 1$$

This condition is sometimes assumed to be fulfilled. However, it is also true or approximately true when coefficients are derived from the empirical data. Accordingly, the Cobb-Douglas function is often written as:

$$Q = a L^p C^{1-p}$$

Where Q is the output, L is amount of labour, C is the capital employed and 'a' and 'p' are positive constants ( $p < 1$ ). In the production function solved by Cobb-Douglas, the share of labour to an increase in manufacturing industry was  $\frac{3}{4}$  and that of capital,  $\frac{1}{4}$ . Thus, the Cobb-Douglas production function in which:

$$Q = \alpha L^{\frac{3}{4}} C^{\frac{1}{4}}$$

Shows constant returns to scale because the total of the values L and C is equal to one ( $\frac{3}{4} + \frac{1}{4} = 1$ ). In order to prove it, let us increase the quantities of labour and capital by 'g' times. Then output would be:

$$\text{Given P.F.} = Q = a L^p C^{(1-p)}$$

$$\text{Now } Q = a (gL)^p (gC)^{1-p}$$

$$\text{But } g^p g^{1-p} = g$$

$$\begin{aligned} \therefore \alpha (gL)^p (gC)^{1-p} &= \left( \frac{g^p g^{1-p} a L^p C^{1-p}}{g [a L^p C^{1-p}]} \right) \\ &= gQ \end{aligned}$$

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**NOTES****(iii) Linear homogeneous function**

A production function which is homogeneous of degree 1 is known as a linear homogeneous production function. In the case of such a function, all factors of production increase in the same proportion. Hence, it represents the case of constant returns to scale. Linear production function in its usual form (in the case of two inputs, labour and capital), can be expressed as:

$$mY = f(mx, my)$$

where Y stands for total production and m is any real number.

The above function shows that if the inputs x and y are increased by an amount m, then output y will also increase by an amount m.

**(iv) Spillman production function**

It was maintained by early soil scientists that if all other factors are present in quantities sufficient to allow a maximum physical yield per acre, with one single element being a limiting factor, increase in output will be directly proportional to increase in input of this limiting factor. In this case, the production function for this limiting factor is linear and every 1 per cent increase in input is accompanied by a 1 per cent increase in output. Constant productivity will prevail until the input of the limiting factor is enough to allow a maximum yield per acre. Let us suppose that 30 kg of phosphorus (P), 60 kg of Nitrogen (N) and 15 kg of Potash (K) are necessary for the production of a maximum physical output per acre. As seen in Table 6.1, the yield would be proportional to the availability of nitrogen. The yield would relate in a linear manner to the input of N.

In Table 6.1, a yield of 20 kg of corn would be possible with inputs of 20, 15 and 30 kg of N, P and K respectively. On the other hand, a yield of 40 kg of corn would be possible with inputs of 40, 15 and 30 kgs.

**Table 6.1** Production Function - Yield of Corn with P and K

<b>N</b>	<b>P</b>	<b>K</b>	<b>Yield Kgs.</b>
20	15	30	20
40	15	30	40
60	15	30	60

This law of the soil (showing linear relationship between output and limitational factor) has long been abandoned. Recent research has led to the acceptance of diminishing rather than constant productivity of single factors, applied to a fixed area of land. Many researches on fertility of soil have established that increased inputs of homogeneous fertilizers result in diminishing returns. 'One widely-held notion is that the production function for a single factor such as nitrogen fertilizer, phosphate, seed, or irrigation water can be described as a decreasing geometric

series, wherein each marginal product represents a constant percentage of the previous one. Under this supposition, if the first 20 pounds of fertilizer or the first inch of irrigation water adds 10 bushels to the total yield, the second will add 9 bushels and the third will add 8.1 bushels, with each increment equal to 90 per cent of the previous one.

It was W.J. Spillman, who first illustrated how an equation of this sort could be fitted not only to soil input-output relationship, but even to the production of feed for livestock. These days, the Spillman production function is generally employed by many agricultural economists. It can be expressed as:

$$Y = m - ar^x$$

Where  $Y$  = total production

$X$  = quantity of variable factor

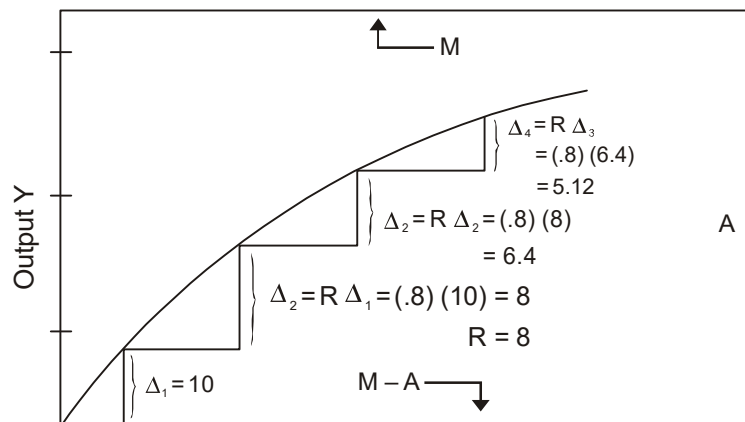
$m$  = maximum output which can be attained from the fixed technical unit

$r$  = the ratio by which increments are added to the total production

$a$  = maximum output which can be added by a particular variable factor

$M-a$ , is the level of output defined by fixed resources and a zero input of the variable resource, i.e., it is the output produced solely by fixed factors.

Based on the above concepts, the Spillman equation finds expression as shown by the curve in Figure 6.2.



**Fig. 6.2** Spillman Curve

From Figure 6.2, we find that the output is increasing at a decreasing rate. The increments in product, due to increments in input, are indicated as  $\Delta_1$ . The product curve approaches the maximum  $M$ , as  $X$  increases and  $AR$  decreases.

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Hence, if  $R = 0.3$  and the marginal product for  $X_1-2$  is 10, the term  $ar^*$  is (approaches) zero and hence,  $ar^* = m$ , the maximum yield.

### (v) The Constant Elasticity of Substitution function

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This is a new function which is similar to the Cobb-Douglas function, such that it has a constant elasticity of substituting. However, unlike the Cobb-Douglas function, its elasticity of substitution is not constrained to unity. The function is known as the Constant Elasticity of Substitution Production (CES) and includes the Cobb-Douglas factor, as a special case. This function was used by Swan and Solow in 1956, but the function was popularized by Arrow, Chinery, Minhas and Solow in their joint article. In its general form, it may be written as:

$$Q = A [\alpha_1 K^{-\beta} + \alpha_2 L^{-\beta}]^{-\lambda}$$

$$[-A > 0; \alpha_1 > 0, \beta > 0]$$

Where  $Q$  is output,  $L$  is labour,  $K$  is capital,  $A$  is efficiency parameter,  $\alpha_1$  is capital intensity factor coefficient and  $\alpha_2$  is labour intensity coefficient.  $\beta$  is the substitution parameter and is related to the elasticity of substitution and  $\lambda$  represents the degree of homogeneity of the function or the degree of returns to scale, CES. Function consists of three variables  $Q$ ,  $L$  and  $K$  and five parameters,  $A$ ,  $\alpha_1$ ,  $\alpha_2$ ,  $\beta$  and  $\lambda$ . The elasticity of production in this function is given by  $\lambda$  and the value of the elasticity of substitution ( $\sigma$ ) is  $1/1 + \beta$ , which is constant but not necessarily equal to unity.

#### Limitations:

Production function approach cannot be recommended for a universal application or farm management decision. Its limitations and the pitfall in its use must be kept in view when an analysis through this approach is proposed.

### 2. Farm planning

Planning is fundamental to the management process, because it is the source, from which all other management activities emerge. It implies a thorough understanding of the goals of a particular farm. It requires intellectual effort, reflective thinking, foresight and imagination. Planning describes what courses of action should be adopted and how and when they should be followed. Effective planning involves answering many questions. Why must activity be carried out? Where and when will it take place? Who will do it and how? When these questions are answered, the result is a statement of objectives, policies and procedures that the business will follow. Necessarily, planning is deeply involved in policy-making and its implementation.

Farming has become a complex business and requires careful planning for successful operation. Adoption of a single new practice may change the whole business. An improved cropping system may mean changes in the livestock

programme, which in turn may require replanning of buildings or machines or labour programmes. According to Foreman, 'Farm planning is simply the process of deciding things like which crops to grow, in what quantity and in what order; how many animals of various classes to keep and how to manage them; what building equipment, labour and power will be required and so forth'.

Farm planning has also been defined as a decision-making process; a conscious determination of the course of action, the basing of decisions on purpose, facts and considered estimates. From these definitions, it may be concluded that farm planning is a primary and preparatory function, which involves assessment of the size of available resources, estimation of their requirements in the light of pre-determined targets of production and their allocation. The farm planning is to a farmer, what blueprint or architect's specifications are to a building contractor. It is a deliberate and conscious effort on the part of the farmer to think about farm programmes in advance and adjust them according to technological development, changes in physical and economic situations, price structures, etc. Thus, farm planning is a process of observation appraisal and analysis of weighing the merits of new and old ideas and then deciding which ideas to use in future.

### **Requirement of farm planning**

Realistic farm planning is based upon accurate analysis of:

- (i) All our resources (What we have)
- (ii) Our past performance (Where we have been)
- (iii) Our present situation (Where we are now)
- (iv) Our future goals (Where we are going)

Equipped with the analysis of these facts, the farm manager identifies his major problems and develops tentative solutions. Hence, his proposed activities are projected into foreseeable future, in the light of available facts.

Farm planning includes identifying and solving problems; exploring and determining the best, easiest and quickest ways and means of attaining the established objectives; producing adequate resources, personnel, materials and facilities.

### **3. Budgeting**

The objective of profit maximization or cost minimization in farming can be achieved through different methods of farm business analysis. Budgeting and linear programming are two such methods, which enable a farmer to achieve his objective. As in other laws of economics, these methods are based on several assumptions and within these assumptions, the application of budgeting and linear programming assists a farmer in selecting a production strategy that maximizes his benefit. Farming is no longer a simple business as it was in its traditional setting and therefore, it requires a more systematic approach for successful operation. Owing to the

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changing farm technology, the whole range of farm operations may have to be adjusted and readjusted in quick succession. Farm budget refers to a well-knit programme of farm activities and methods to be adopted by a farmer to achieve his objective. Changes in techniques, prices and inputs often lead to major adjustments in agricultural operations. A farmer can possibly think of several alternative farm plans and may finally adopt the best one. Farm budget is thus a method of preparing several alternative plans and placing these at the disposal of farm decision-maker, each plan being a programme of total farm activity is drawn up in advance. It should be borne in mind that it is the monetary expression of a plan in terms of receipts, expenses and net income, which is given the name of a farm budget. Alternatively, therefore, a farm budget may be treated as a process of estimating costs, returns and profits of an enterprise. Budgeting and planning are closely related to each other. While a budgeting helps in selecting the best plan, the plan without a budget does not mean much.

***Types of budgets***

Farm budgets are of two types: a partial budget and a complete budget. When a plan is drawn to estimate the returns from a part of the farm business, it is referred to as a partial farm budget. On the other hand, a complete budget refers to a plan of the entire farm business. Many a times, a farmer may not be interested in changing or revising all his farm activities and may wish to read just a few of them, in order to experiment with some new techniques that have been developed. An instance of this is a farmer raising maize, wheat and rice on his farm. He may only be interested in changing or revising all his farm activities and may wish to read just a few of them in order to experiment with some new techniques that have been developed. In addition to this, the farmer may only be interested in growing a new variety of wheat on a limited area of his holding. He shall, in this case, have to do partial budgeting. One major advantage of partial budgeting is that it is neither complex nor time-consuming. It gives quick estimates of costs and benefits of a single enterprise and does not take the entire farm business into account. Needless to say, it certainly must suffer all the disadvantages of a partial approach such as not taking stock of all the disadvantages of a partial approach, not taking stock of all relevant factors that go into maximization of net returns from the whole farm, not allowing substitution between resources and ignoring substitutability between different farm enterprises. A simple illustration (Table 6.2) will make the concept clearer.

Suppose a mechanical device has been developed for preparation of seed beds. A farmer, before deciding in favour of adopting this mechanical device, will prepare a cost-benefit statement. He will take into account the cost of hiring or purchasing the new device and the cost of its maintenance, against the benefit he is likely to get (time saved, reduced manual input). A budgetary statement for this plan is shown in Table 6.2.



Table 6.2 Budgetary Statement

Debit		credit	
(a) Increase in costs (per acre)		(a) Decrease in cost (per acre)	
i. Hiring charges @ ₹ 15 per day for two days		i. Manual labour 2@ ₹ 12 per day for 10 days.	= 120
ii. Running expenses petrol, mobile oil, power	= 30 = 60	(b) Increase in returns (per acre)	= Nil
(b) Decrease in return (per acre)	= Nil	Total benefit	= 120
Total Cost	= 90		
Net gain = ₹ 120.00 – 90.00 = ₹ 30.00			

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**Complete budget**

Complete budget pertains to a plan for the entire farm business. It is a statement of objectives, strategies and expenses involved in the completion of a complete plan, pertaining to a single farm enterprise. Complete reorganization of farm business calls for an elaborate plan regarding crops, livestock, methods of cultivation, costs and benefits.

For drawing such a complete budget, the farmer is required to prepare both, long and short-term plans. Usually, a long-term plan is prepared, aiming at structural transformation of the existing farm business. It is sought to be accomplished with the help of short-term plans. A farmer may draw a ten-year plan for complete reorganization of his business, but he goes on achieving his goal in a phased manner by preparing annual plans.

The basic objective of a long-term plan is to improve returns from a farm, in a substantial manner. The complete plan therefore, takes note of changing technology, resource position and a variety of farm enterprises. The alternative uses of resources and their comparative advantages and disadvantages have also to be carefully assessed. Budgeting, in its complete sense, is therefore more time-consuming and demands greater efforts. The success of the budget shall certainly depend on the degree of accuracy of the basic data used in its preparation.

**Steps in farm budgeting**

As in financial budgeting, farm budgeting also needs to be approached in a systematic manner. Each farmer prepares a budget that is the best in his own judgment. But as a matter of fact, there has to be an orderly approach that is

objectively followed by any farmer, while preparing his budget. The steps followed in an orderly preparation of a budget are listed as follows:

**(i) A Statement of Resources**

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Farm enterprise resources include land, labour, capital and management. An exhaustive statement of land resources; soil, quality, topographic and agro-climatic conditions has to be judiciously prepared in advance. In a similar fashion, a list of labour, capital and management resources also has to be prepared. Labour includes both, human and animal labour, their quality and production capabilities. Capital includes all machinery, tools and implements, buildings, credit, etc. Similarly, management includes managerial qualities of the farmer himself, his expertise and foresight.

**(ii) A Statement of Cropping Pattern**

After taking stock of limited resources, the next step in farm budget preparation is to decide on the type of crops to be raised, or varieties of livestock to be reared. The choice of crops and livestock shall obviously depend on prospective yields. A farmer must be good in calculations and only then, he can make the right type of choice of crops and livestock. Equally important is the sequence of crops the farmer would like to follow for the next several years.

**(iii) Specification of prices and expenses**

The implementation of a farm budget requires a farmer to have an idea about prices for the next few years, so that he can work out the expenses of several other resources. It certainly needs very intelligent guess-work to predict the prices. There are known forecasting methods that a farmer can use, but more important is his own outlook. He may, for instance, on the basis of past experience, predict nearly accurately, the prices for the next year and make his calculations accordingly. He shall have to take into account changes in technology, alternative use of resources and prices of related commodities.

**(iv) Specification of farm technology**

This refers to specification of farm practices, the nature of technology and possibilities of changes in it. There must be close link between the farmer and the farm researcher so that updated information is passed on to the farmer as and when it becomes available. It enables him to work out input-output coefficient and specify the precise resource mix in his plan.

**(v) Assessment of the existing plan**

The final step in preparation of a farm budget is to access positive and negative points of the present plan. This enables the farmer to eliminate shortcomings and accommodate positive aspects of the existing plan into the new budget. Once the plan is ready, it is equally important to check whether its different stages are being successfully implemented.

#### 4. Linear Programming

Linear programming is a technique of considering different linear inequalities pertaining to a specific situation, to find the best value for that situation. Mathematically speaking, it applies to those problems which are related to maximization or minimization of a system of linear inequalities, stated in terms of certain variables. When cost and price per unit change with the size of output, the problem is not linear and if they do not change with output, the problem is linear. Linear programming may thus be defined as a method to decide the optimum combination of factors to produce a given output, or the optimum combination of products to be produced by the given inputs.

##### The problem and its solution

Linear programming is a systematic method of determining the optimum combination of activities, so as to maximize income or minimize cost, within the given constraints.

Let us assume that we are faced with the problem of maximization. The problem can be mathematically resolved by linear programming methods as follows:

$$\text{Max } Z = C_1 X_1 + C_2 X_2 + \dots + C_n X_n$$

Subject to

$$a_{11} x_1 + a_{12} x_2 + a_{13} x_3 + \dots + a_{1n} x_n < b_1$$

$$a_{21} x_1 + a_{22} x_2 + a_{23} x_3 + \dots + a_{2n} x_n < b_2$$

The next questions that arises is:

How many acres of rice and cotton should be produced, if the total revenue is to be maximized?

All this information can be displayed as shown in Table 6.3.

**Table 6.3** Objective Functions, Resource Requirement Matrix and Resource Constraints

Objective Function	
Max ₹ 20 X acres under rice (Y) + ₹ 150 X	
Acres under cotton (C)	

##### Resource Constraints and Resource Requirement Matrix

Resources	Availability level	Resource Requirement	
		Rice	Cotton
Labour	60 (man-days)	5	6
Fertilizers	80 (kgs)	10	4

Table 6.3 can be used to explain some of the basic concepts, used in a linear programming problem.

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**NOTES****(i) Objective function**

This function indicates the quantity to be maximized (or minimized if the problem is concerned with minimization). In the present case, the total revenue earned by the production of a combination of some quantities of rice and cotton is to be maximized. If we denote  $Y$  as acres of rice and  $C$  as acres of cotton to be produced, then mathematically, the objective function will be:  $\text{Max } Z (\text{total revenue}) = 200Y + 150C$ . This obviously becomes a linear function. Linear programming always has a linear objective function. In this function,  $Y$  and  $C$  are called choice variables and 20 and 150, the coefficient of the objective function.

**(ii) Constraints**

In a linear programming problem the maximization or minimization of an objective function is always subject to some constraints. The maximum or minimum value of the objective function will be indeterminate. In the above case, constraints are indicated by 60 units of labour and 80 units of fertilizers. We have to maximize the objective function total revenue in the present case, with these resources. If these constraints are changed, obviously the maximum value of the objective function will change. There are also constraints in case of problems related to minimization. Let us take an instance where there are two types of foods, each containing a certain combination of calories and vitamins. The price of a unit of each food is given. The object may be to determine which combination of two foods will cost the minimum. This is subject to constraints that the combination yields at least a predetermined level of total calories, as well as total vitamins. There are generally two types of constraints in the linear programming problem. The first constraint is related to non-negativity. This expresses the fact that certain variables cannot have negative values in the final solution.

**(iii) Choice variables**

Choice variables are variables in terms of which the objective function of a linear programming problem is expressed. The linear programming technique aims at finding the values of these variables that would maximize or minimize (as the case may be) the given objective function. It can be considered that every element related to an activity in the linear programming problem is expressed in terms of a relevant choice variable.

**(iv) Technical coefficients**

Technical coefficients indicate the amount of scarce resources that represent the constraints, needed for generating one unit of a choice variable for an activity. Each coefficient in the objective function indicates the returns or cost for one unit of a choice variable, representing a particular activity.

## Feasible solutions

Farming System

Feasibility of a solution in a linear programming problem is determined by the constraints in that problem. All solutions which satisfy the given constraints are feasible solutions. In fact constraints carve out an area which indicates all feasible solutions. Let us take an example (Figure 6.3) where we have two constraints and two activities. The first constraint is that of labour. The total amount of available labour is 60 units. 5 units of labour are required to produce rice on one acre (Y) and 6 units of labour are used to produce cotton on another acre (C), we can put this information in the form of an equation as:  $5Y + 6C = 60$ . Similarly, the constraint for fertilizers can be expressed as:

$$10Y + 4C = 80$$

There are two equations shown by different lines. Figure 6.3 is a graphical representation of these lines, showing Y (acres of cotton) on y-axis and r (acres of rice) on x-axis.

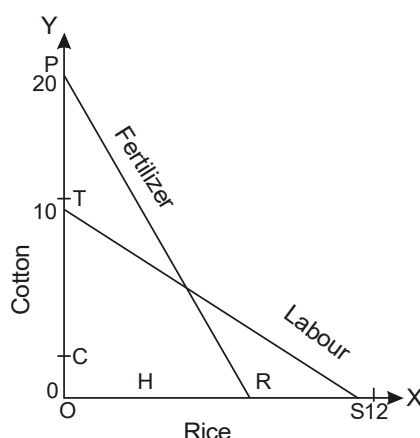


Fig. 6.3 Feasible Solutions

In Figure 6.3, TS is the line for labour and PR is the line for fertilizers. Now let us see which combinations of cotton and rice satisfy both constraints. For each crop, scarce resources would set a limit to its production. For example, though we can produce 12 acres (OS) of rice with labour, we can produce only 8 acres (OR) of rice with fertilizers. As rice has to be produced by using both the inputs in specified quantities, we shall not be able to produce more than 8 acres (OR) of rice if both the resource constraints for the production of rice are to be met. Of course we can always produce less than 8 acres of rice and still satisfy the constraints of the production of rice. Similarly, we should produce 10 acres (OT) or less cotton, if the resource constraints for production of cotton are to be satisfied. In other words, the area enclosed by RMT contains all those points which represent different combinations of cotton and rice, which satisfy the two resource constraints. All these points represent feasible solutions. We may note here that as the choice variable can only have a non-negative value, the area of feasible solutions is enclosed

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by OX and OY (i.e., solutions lie in the first quadrant). Points like T, M, R, O, G, H, all represent feasible solutions.

### Basic feasible solution

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In technical terms, a basic feasible solution is one in which the number of non-zero variables is equal to the number of constraints given in the original problem. In simple terms, ordinary variables represent activities included in the input. Output matrix is:  $X_1 X_2 \dots X_n$ . The slack variables, in a way represent the totally or partially unutilized constraints in a given solution. A basic feasible solution can be defined as one in which the number of activities included in the solution (these will obviously have a non-zero value), plus the number of unexhausted constraints in the solution is equal to the total number of constraints included in the original input-output matrix set from the linear programming problem. This also means that any feasible solution will be called a basic feasible solution, if the number of activities actually included in the solution is just equal to the number of constraints which have been fully utilized, in order to arrive at such a solution. According to this definition, while the solutions represented by the points O, T, M and R in Figure 6.3 are basic feasible solutions, those represented by points G and H are non-basic feasible solutions. This figure is based on the assumption that there are two activities (production of rice and cotton) and two constraints (labour and fertilizers) in the concerned problem.

### The optimum solution

From an infinite number of feasible solutions, one which yields the highest (or lowest) value of the objective function is called the optimum solution. If we assume the problem to be the one with two products and two constraints, the objective function can be considered to represent a set of iso revenue lines. One of these lines will show the maximum achievable revenue at the corner M, of the feasible area represented by RMT. The optimum solution could be at one of the other two corners, namely R or T, if the slope of the iso revenue lines based upon the objective function is different. Thus, if the coefficients of the objective function are different, the equilibrium will always be at a point represented by a corner. It can also be assumed that the optimum solution will always be one of the basic feasible solutions. The basic feasible solutions, as we know are always found at the corner of a feasible area. In case, the linear programming problem deals with two products, but with more than two constraints, the feasible area will have more such corners and the optimum solution will always be indicated by one of these corners. In a minimization problem too, the solution will be in one of the corners enclosed by the feasible area.

### The simple method

Suppose we consider Figure 6.3, where there are two products and two or more constraints. All constraints, (whether one or more) are used to produce two

products and only these determine the feasible area. As long as the number of products is two, the result would be two-dimensional figures. This is known as area. If the number of products is more than two, a multi-dimensional space will be enclosed by the lines representing various constraints. This is called a polyhedron. However, simple geometry will not help us in finding the optimum combination of three or more products. Some other algebraic method has to be used to find the optimum solution. The method commonly used is known as simple method. Here, the actual technique followed in this method is not explained. However, this method implies a step-by-step movement from one corner (representing a basic feasible solution) of the polyhedron to its other corner. Every movement (iteration) is shifted to the higher (or in case of a minimization problem, to a lower) value of the objective function, till no increase (or decrease) in the value of the objective function is observed. The first corner, which this method takes for a start is the origin itself (in a maximization problem) where the value of the objective function is zero. In case of a minimization problem, there is some difference in technique with reference to the initial feasible solution. This cannot be represented by the origin. In fact, the linear programming method in this case takes us towards the origin. The origin in other words, can be the goal and not the start. So in this case (cost minimization problem) one has to initially, arbitrarily choose a combination of given inputs (foods in our problem), to get the required amount of output (calorie and vitamins) and take this as the initial basic feasible solution. From this, the Simplex method checks and compares the costs incurred due to other basic feasible solutions and arrives at the ultimate optimum solution.

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### Assumptions of linear programming

Linear programming analysis of a farm is based on the following assumptions:

1. The decision-making body is based on certain constraints or resource restrictions. They may be credit, fertilizers or labour constraints on its activities. Types of constraints in fact depend on the nature of the problem. Mostly they are fixed factors in the production process.
2. It assumes a limited number of alternative production processes.
3. It assumes linear relations among different variables, which implies constant proportionality between inputs and outputs within a process.
4. Input-output prices and coefficients are given and constant. They are known with certainty.
5. The total resources used by all firms must equal the sum of resources used by each individual farmer.
6. Linear programming techniques further assume continuity and divisibility in products and factors.
7. Institutional factor are also assumed to be constant.

8. For programming, a certain period is assumed. For convenience and more accurate results, the period is generally short, though longer periods are not ruled out.

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### Limitations of linear programming

Linear programming has proved to be a highly useful tool of analysis for farm management. Theoretically, it is being widely used, but it has its limitations. Its limitations are as follows:

- (i) It is not easy to define a specific objective function.
- (ii) Even if a specific objective function is laid down, it may not be so easy to find out various technological, financial and other constraints, which may be operative in pursuing the given objective.
- (iii) For a given specific objective and set of constraints, it is possible that constraints may not be directly expressible as linear inequalities.
- (iv) Even if the above problems are surmounted, a major problem is one of estimating relevant values of various constant coefficients that enter into a linear programming model.
- (v) This technique is based on assumption of linear relations between inputs and outputs. This means that inputs and outputs can be added, multiplied and divided. However, the relations between inputs and outputs are not always linear. In practical terms, most of the relations are non-linear.
- (vi) This technique assumes perfect competition in product and factor markets.
- (vii) This technique is based on the assumption of constant returns, which is practically either diminishing or increasing returns which a farmer experiences in production.
- (viii) It is a highly mathematical and complicated technique. The solution of a problem with linear programming requires maximization or minimization of a clearly specified variable.
- (ix) The solution of a linear programming problem can also involve a large number of mathematical calculations, which require a special competition technique, an electric computer or desk calculator. Such computers are not only costly, but also require experts to operate them and task is beyond the approach of farmers.

### Check Your Progress

1. Define the term farm management.
2. Name the main tools of farm management.



## 6.3 FARM ORGANIZATIONS

There are many types of farm organizations across the world. Some of the important ones are:

- Peasant family farming
- Capitalistic farming
- State farming
- Collective farming
- Cooperative farming

A brief description of these farm organizations as follows:

### 6.3.1 Peasant Family Farming

This is also known as family farming. This farm organization is parallel to private entrepreneurship in an industry. The owner of the farm himself controls it, i.e., he takes decisions about cultivation and also works on it. He does not engage outside workers to cultivate the farm, rather, he uses the family labour for various agricultural operations. Sometimes, the peasant, instead of being an owner of the land, can be a tenant who manages the cultivation of land and uses the labour of his family for purpose of cultivation.

The chief feature of peasant farming is small size of the farm that is to be cultivated. This gives rise to the following problems:

- In some cases, the size can be so small that it may not permit optimum use of family labour, or a pair of bullocks, or available farm implements and other assets or managerial potentials of the farmer.
- The small size of the farm also hinders adoption of modern technology, mainly because of the limitation of financial resources.
- Improved practices like drainage, fencing, rotation of crops, etc., cannot be adopted.
- In addition to this, the pattern of crops under peasant farming will not be market-oriented. As the size of the farm is small and the farmer prefers to meet his domestic needs from the farm itself, the production will mainly be for domestic consumption.
- Thus, peasant farming generally leads to subsistence farming and not commercial farming.
- It is obvious that the peasant farmer will be generally out of touch with the changing market trends and will remain uninfluenced by them. Therefore he will not be very commercially inclined.

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Peasant farming has some advantages too (due to small size of the farm). These are as follows:

- Incentive for hard work is generated by ownership (because the farmer knows that the whole produce obtained from his land holding belongs to him)
- Effective supervision and possibility of quick decisions
- Insulation against adverse market trends because the farm is not part of the market
- Relatively greater employment per acre and relatively greater intensity of cropping

According to the World Bank, family labour is more responsible and devoted when compared with a hired labour. This also adds to the quantity/quality of output.

If this farm organization is universally adopted in an economy, it will also ensure greater social justice among farmers.

### **6.3.2 Capitalistic Farming**

The main characteristics of capitalistic farming are large size of the farm, use of sophisticated machinery and hired labour for cultivation. In this type of farming, if the farm is owned by an individual landlord, he or the manager appointed by him will be controlling its operations. This type of farming is also known as 'estate farming'. Sometimes, such a farm is even owned by a joint stock company. In such a case, the directors and the managers appointed by the company will look after the operations and management of the farm. Capitalistic farming, undertaken by a joint stock company is also known as 'corporate farming.'

In corporate farming, nearly the entire cultivation is done for the market. The crop pattern is generally so devised as to ensure maximum profits for the company. This type of farming is quite popular in the USA, Australia and England. In India, tea, coffee and rubber plantations are examples of capitalistic farming.

Capitalistic farming has all advantages of large-scale production. It can reap various types of technical, commercial and financial economies. Research activities concerning various operations on the farm can also be undertaken. However, this type of farm organization too, has its drawbacks. The most disturbing outcome of this type of farming is the unemployment generated by excessive use of machinery. This very factor reduces the bargaining power of workers and leads to their exploitation. This system is responsible for unfair distribution of income and social injustice. Because of the large size of the farm, a large number of supervisors will have to be engaged. As the supervisors do not have an incentive of ownership, their supervision is generally defective.

### **6.3.3 State Farming**

This is not the same thing as estate farming (capitalistic farming). In this farm organization, we have the state, rather than private shareholders, as owner of the

farm. The management consists of representatives and managers appointed by the state. As in the case of corporate farming, cultivation is done by hired labourers and sophisticated machinery is used. The size of the farm is large and the crop pattern may be so devised as to meet some social needs. However, unlike corporate farming, crop planning and price policy need not be aimed at maximization of profits. Although so far, state farming was an important feature of the Russian economy, some state farms also exist in India.

The advantages of state farming are almost similar to those attributed to capitalistic farming. All advantages of large-scale production can be reaped through state farming. In fact, some of the disadvantages of corporate farming like exploitation of labour and reduction in employment opportunities can be controlled to some extent by the deliberate policy of the state. The profits of cultivation, if any, accrue to the state rather than to private shareholders. Thus, to a certain extent, it may not lead to an unfair distribution of income.

#### 6.3.4 Collective Farming

In this type of farm organization, land, livestock and other capital assets belong to a community as a whole. There is no individual ownership. Members of the community who own the farm are also expected to work as labourers on it. They are considered as members of the general body of the farm. They elect a Board of Management, which controls and supervises various operations on the farm. Some of the members of the management body may also be nominated by the government. This board plans the pattern of crops, purchases various farm inputs, arranges for marketing of crops and keeps in touch with the government for various guidelines related to production, etc. It also arranges for various social services for members of the collective farm, e.g., education, medical facilities and recreation.

#### 6.3.5 Cooperative Farming

A cooperative farm is a voluntary organization of individual land owners, for the purpose of joint cultivation of land. A member of a cooperative farm can withdraw his membership from it and can resume individual cultivation of his own land, if he chooses to do so. The control of a cooperative farm lies with an elected body. The managing body is elected by members of the cooperative farming society. They also arrange for procurement of inputs and sale of produce in the market. For the purpose of crop planning, the whole land pooled by the members and is considered as one form. As the size of the land is large, it is possible to use modern machinery and adopt improved agricultural techniques for its cultivation. Cooperative farms can hire external labourers.

#### Check Your Progress

3. Name few important farming organizations across the world.
4. What is the chief feature of peasant farming?

## NOTES

## 6.4 COST CONCEPTS AND PROFIT MAXIMIZATION

### NOTES

Cost production is an important factor in profit maximization and any rational farmer who aims to earn maximum profit considers the cost of production. In order to increase profits, a farmer usually contemplates cutting costs as a source to increase profits. Outwardly, it seems that cost-cutting is the farmer's main concerns. However, close observation reveals numerous questions of equal importance related to farm management, some which are listed as follows:

- (i) What costs should be cut?
- (ii) What costs can be cut?
- (iii) Are there not items of cost that should be increased rather than cut?
- (iv) Does minimum average cost result in maximum profit?
- (v) How do costs vary with output?
- (vi) What should be charged to the farm when net returns are computed?

These questions will be analysed in detail later on in the unit.

The economist's understanding of cost differs from that of the accountant. It is different because the layman's concept of costs tends to be closer to the concept of cost used in accountancy. The primary concerns of an accountant are paid-out costs, such as wages, seed bills and purchase feed. On the other hand, the economist is interested in imputed costs which can be defined as the costs pertaining to the farmer's own labour, feed for livestock grown on the farm, etc, which are not covered by any monetary transaction, and yet do represent a use of real resources, which might have been used to produce something else. Such costs can most easily be measured by estimating the monetary cost of the factors concerned if they had, in fact, been bought or hired. There are different connotations for the term cost. Therefore, it is important to have a terminological clarity to differentiate among these connotations and understand when to use which.

### Real costs and money costs

Alfred Marshall defines the real costs of productions to be exertions of different types of labour which may or may not be directly or indirectly involved in fulfilling it irrespective of abstinences instead of waiting to raise the required capital. But modern economists rarely employ this term; instead, they accept cost in money terms. Money cost of product for the farmer would mean the aggregate money expenditure incurred by him on the various items entering into the production of a farm commodity. The concept of real cost though of little significance in the analysis of price that is more important from the social point of view. Therefore, the real cost of a farm product would be the efforts and sacrifices undergone by the farmer in producing that commodity. However, the main drawback with this concept is

that the efforts and sacrifices are a subjective phenomenon, so therefore cannot be subjected to accurate measurement.

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### **Social cost and private costs of production**

Another concept of cost which has become popular in recent times is social costs or opportunity costs. If by using a bundle of resources, X commodity is raised on the farm, the social cost of raising this commodity will be commodity Y which has been sacrificed. If a farmer raises paddy instead of maize, the social cost of raising paddy will be the amount of maize sacrificed in the process. It is also known as alternative or opportunity cost of production.

Private cost of production refers to the individual farmer and would include explicit costs (actual money expenses directly incurred in raising a farm commodity plus the monetary estimates of implicit costs). Implicit costs are the money value of those inputs which are supplied by the farmer himself. In the implicit cost, we may include money value of managerial services of the farmer, interest on his invested capital and rent on his own land. We may here distinguish between accounting costs and economist cost.

$$\text{Economist Cost} = \text{Accounting Cost (Explicit Cost)} + \text{Implicit Cost.}$$

A farmer would earn economic profit only if he is earning revenue in excess of the total accounting and implicit cost.

### **Fixed and variable costs**

There are some inputs or factors which can be readily adjusted with the change in the output level. Thus, a farmer can readily employ more labour, more chemicals or more seeds without much delay if he has to expand production of a particular crop. These factors or inputs which can be readily varied in response to a change in output are known as variable factor. On the other hand, there are certain input factors, such as land machinery, building, etc., which cannot be varied early in the short period.

Corresponding to the distinction made between variable and fixed factors, economists draw a line between variable costs and fixed costs, the addition of which gives the total cost.

Fixed costs are those costs that do not change as output changes. These are independent of output and are a fixed amount which must be incurred by a farm firm in the short-run, irrespective of the output being small or large. They will be at the maximum level when output is zero and their incidence will go on decreasing as output gets extended beyond the zero level. In the long-run, however, all costs become variable because more opportunities exist to arrange all the factor of production, including plants and machinery. A tax on land, for example, would be treated as fixed cost of production. A farmer pays the same property tax if he raises 150 quintals of paddy on his land or leaves it fallow. The costs that are fixed include unpaid farm labour, taxes, depreciation, insurance, interest on borrowed

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capital and some maintenance repairs. Fixed costs on an Indian farm for a period of one year include.

- (i) Land revenue or land rent;
- (ii) That part of depreciation on buildings, machinery and livestock that does not vary with their use but results from the passage of time alone;
- (iii) Insurance on buildings, equipment and livestock;
- (iv) Wages of labour hired on a year-round basis;
- (v) Cost of all family labour employed on the farm; and
- (vi) Maintenance cost of farm work animals.

**Variable costs**

Farming expenses which are a function of farm output are known as variable costs. There will be no variable costs if a farmer decides to leave his land idle for a year. These costs, therefore, change with the quantity of production. These costs include payments such as wages paid to hired labour, the price of seeds, fertilizers, pesticides, fuel and power used, expenses incurred on transport and the like. Since variable costs are a function of output, total variable costs increase with the level of farm production. Variable costs play an important role since they help the farmer decide how much to produce or whether he should produce at all. If the farmer is to carry on the production of a particular commodity, the variable cost must be less than the selling price. Variable costs on a typical Indian farm include

- (i) Cost of current supplies such as seed, feed, fertilizer and water;
- (ii) Labour hired occasionally;
- (iii) Hired machines and other services;
- (iv) Current repairs replacement which vary with the use of building and equipment; and
- (v) Interest on current investment.

**Different cost elements**

Though we have divided the total cost of production into two broad categories of variable costs and fixed costs, there are seven cost concepts derived from the production that are used in economic analysis which are as follows:

- (i) Total Cost (TC).
- (ii) Total Fixed Cost (TFC).
- (iii) Average Fixed Cost (AFC).
- (iv) Total Variable Cost (TVC).
- (v) Average Variable Cost (AVC).

(vi) Average Total Unit Cost (ATUC).

(vii) Marginal Cost (MC).

**Table 6.4** Provides Hypothetical Cost Data Illustrating the Relationship among the Various Cost Concepts

Unit of Output	Total Cost (TC) ₹	Total Fixed Cost (TFC) ₹	Total Variable Cost (TVC) ₹	Average Total Unit Cost (ATUC) ₹	Average Fixed Cost (AFC) ₹	Average Variable Cost (AVC) ₹	Marginal Cost (MC) ₹
0	50	50	0	-	-	0	-
1	58	50	8	58.00	50.00	8.00	8.00
2	65	50	15	32.50	25.00	7.50	7.00
3	71	50	21	23.64	16.67	7.00	6.00
4	76	50	26	19.00	12.50	6.50	5.00
5	81	50	31	16.20	10.00	6.20	5.00
6	87	50	37	14.50	8.33	6.16	6.00
7	94	50	44	13.42	7.14	6.28	7.00
8	102	50	52	12.75	6.25	6.50	8.00
9	111	50	61	12.33	5.55	6.77	9.00
10	124	50	74	12.40	5.00	7.40	13.00

We may briefly discuss the above terms.

### Total cost (TC)

The total cost of production is the sum total of variable costs and fixed costs and includes both the explicit and implicit costs. Explicit costs are those expenses which the farmer makes in buying seeds, fertilizers, manure and other inputs and services directly. These also include the cash wages paid by the farmer to the hired labourers. Implicit costs, on the other hand, are imputed value of the farmer's own resources and labour. Total cost is defined as the sum of explicit function of the level of output and fixed inputs:

$$TC = TFC + TVC$$

### Total fixed cost (TFC)

As already explained, total fixed cost represents the sum of expenditures which will be incurred, irrespective of the level of output. It is evident from Table 7.1 that whatever has been the level of output (from zero to 10), fixed cost has remained the same, i.e., ₹ 50.00.

### Average fixed cost (AFC)

Average fixed cost is calculated by dividing total fixed cost by the units of output produced.

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$$\text{Thus, } AFC = \frac{TC}{Q}$$

$Q$  = the number of units of farm output.

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### Total variable cost (TVC)

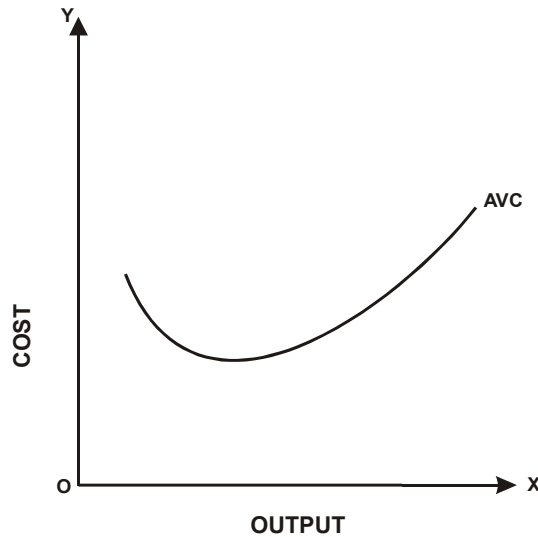
These costs correspond to those factors of production whose supply is variable in the short period and change with the output. These costs are also referred to as 'prime costs,' 'special costs' and also 'direct costs.'

### Average variable cost (AVC)

Average variable cost can be calculated by dividing total variable costs by the number of units of output produced. Therefore,

$$AVC = \frac{TVC}{C}$$

As is it evident from Table 6.4, the average variable cost starts falling as soon as production is extended from zero to normal capacity output due to the law of increasing returns. But once normal capacity is achieved, average variable cost starts rising beyond that point due to the functioning of the law of diminishing returns, depicted in Figure 6.4.



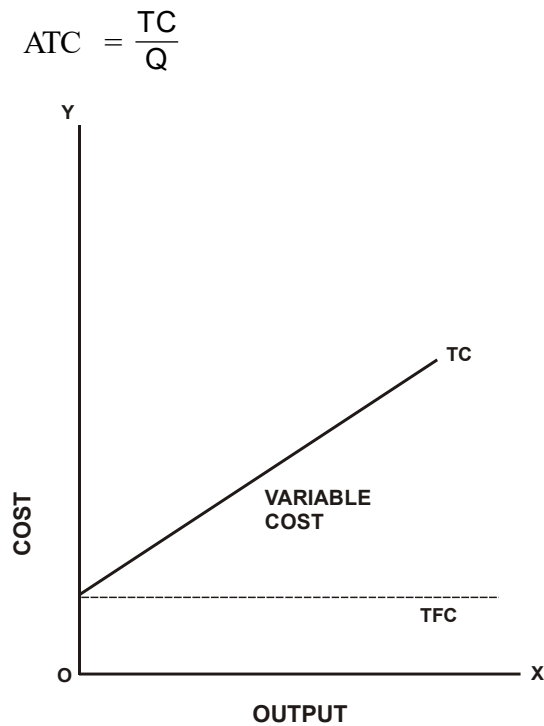
**Fig. 6.4** Average Variable Cost

### Average total cost (ATC)

Average total cost can be calculated by dividing the total cost with the number of units of output produced.

$$ATV = \frac{\text{Total Cost}}{\text{Output}}$$





**Fig. 6.5** Total Cost Curve for a Linear Production Function

### Marginal cost (MC)

The addition to the total cost by the last unit of output is referred to as the marginal cost. It is the addition to the total cost of producing  $n$  units instead of  $n-1$  units. Symbolically,

$$MC_n = TC_n - TC_{n-1}$$

Since marginal cost is the change in total cost as a consequence of adding one more unit, it can also be written as:

$$MC = \frac{\Delta TC}{\Delta q}$$

Where,

$\Delta TC$  = increase in cost

$\Delta q$  = increase in cost

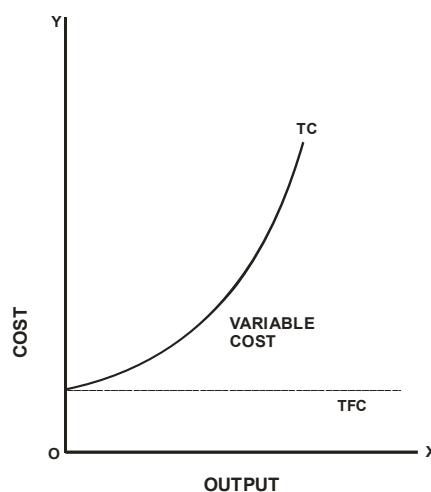
### Relationship between production and cost curves

The exact nature of the total cost curve depends on the nature of the production function which underlies it. Figure 6.5 shows the total cost curve for a linear production function. The portion below the dotted line is the total fixed cost while that lying above is the total variable costs subject to constant marginal productivity. Figure 6.6 represents the total cost function where the factor-product relationship

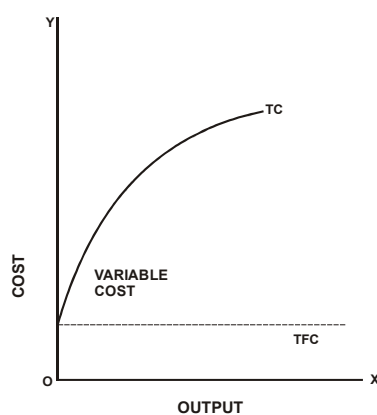
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is one of diminishing marginal productivity. Figure 6.7 illustrates the cost components of a production process, reflecting increasing returns throughout.

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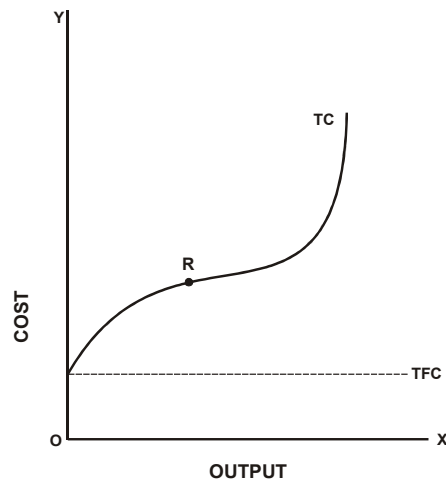


**Fig. 6.6** Diminishing Marginal Productivity



**Fig. 6.7** Cost Component of a Production Process showing increasing returns

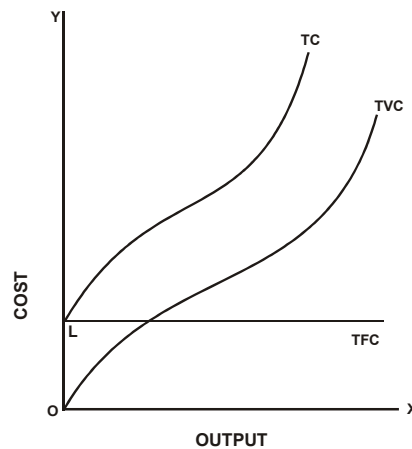
A generalized cost function which includes a range both of increasing and decreasing returns is shown in Figure 6.8. In this case, total costs increase at (i) a decreasing rate over the range of outputs consistent with increasing returns on the production function, (ii) an increasing rate over the range of output defining decreasing returns on the production function. Point R on total cost curve is the inflection point, indicating the change in TC rate of increase on the production function.



**Fig. 6.8** Increase in Total Costs

### Total Cost Curve

Derivation of total cost curve from total fixed costs and total variable costs is depicted in Figure 6.9.



**Fig. 6.9** Total Cost Curve derived from TFC and TVC

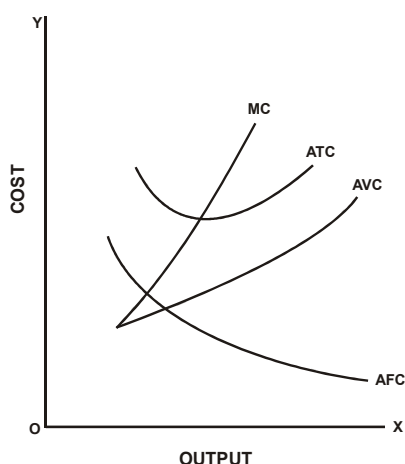
In Figure 6.9 output is measured on the X-axis and cost on Y-axis. Since total fixed cost remains unchanged whatever the level of output be, TFC curve is parallel to the X-axis. On the other hand, TVC curve rises upward showing that as the total output increases, the TVC curve will rise upward. TVC starts from the origin showing that at zero output, TVC will be nil. But in the figure, TC has started from point L on the Y-axis showing that even if no output is produced, a farmer will have to pay fixed costs to the extent of OL.

Average total cost curve has been depicted in Figure 6.10 ATC is the sum of AVC and AFC. Average variable cost starts falling as soon as production is

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extended beyond zero to normal capacity output due to the law of increasing returns. But once normal capacity is achieved, AVC will start rising beyond that point due to the law of diminishing returns. The vertical distance between average total cost curve and average variable cost curve measures the amount of fixed costs per unit at any given point. As expected, this distance between the average total cost curve and the average variable cost curve diminishes when the output rises depicting the fixed costs getting spread over more units of the product.



**Fig. 6.10** Average Total Cost Curve

**Revenue Relationship**

The revenue of a farm along with its costs determines profits reaped by the farmer. After having some knowledge of cost concepts, it is necessary now to study the concept of revenue since the farmer's profit will be equal to the difference between its total revenue and total cost.

The term 'revenue' refers to the receipts obtained by the farmer from the sale of certain quantities of farm products at various price. The revenue concept relates to total revenue, average revenue and marginal revenue.

**Total Revenue**

It refers to the total amount of money that the farmer receives from the sale of his products, i.e., the gross revenue. This will vary with the farmer's sale. Therefore,

$$TR = R(q)$$

Where  $TR$  is total revenue,  $q$  is total production over some period of time.

Total revenue is obviously equal to the quantity sold multiplied by the selling price of the commodity, i.e.,

$$TR = q \times p$$

Where  $p$  is the price unit.

## Average Revenue

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It is calculated by dividing total revenue by the number of units sold, i.e.,

$$AR = \frac{TR}{q} = \frac{q \times p}{q} = p$$

Evidently, the average revenue is the price of the product. So we write.

$$AR = p$$

From above relationship, it follows that the curve which relates average revenue to output is identical with the demand curve that relates price to output.

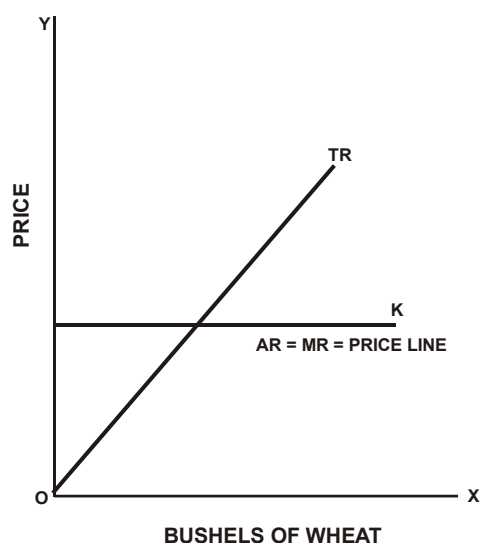
## Marginal Revenue

It is the change in total revenue resulting from an increase in the rate of sale per period of time by one unit.

In general,

$$MR_n = TR_n - TR_{n-1}$$

Under competitive conditions as they exist in agriculture, the amount of product, which is sold by one farmer, does not influence the market price. Since there are a large number of buyers and sellers, the farmer will receive the same price per unit whether he sells 100 quintals or 1,000 quintals of grain. In other words, each unit product sold adds the same amount to the total revenue or gross income. Accordingly, the total revenue curve for an individual farmer is of the general form presented in Figure 6.11.



**Fig. 6.11** Total Revenue Curve

The Curve *TR* is linear indicating that each quintal of grain sold adds the same amount to the gross revenue.

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**Profit maximization**

The farmer will reap maximum profits at a point where marginal revenue will be equal to marginal cost ( $MR = MC$ ). The reason is evident; marginal revenue and marginal cost indicate additions to total revenue and total costs respectively. Hence, it pays the farmer to produce one more unit of output as long as the marginal cost is less than marginal revenue. In doing so, he is adding less to total costs than is added to total revenue. Production of one more unit is always unprofitable if marginal cost is greater than marginal revenue since more is added to total costs than is added to total revenue.

Thus, for a profit maximization output, we may state two important rules.

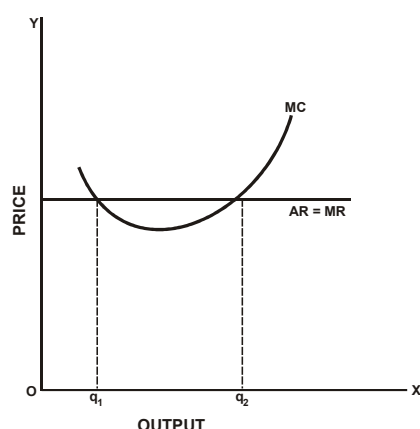
**Rule I.** Farmer should not produce at all if the total revenue from selling the produce does not equal or exceed the total variable cost;

**Rule II.** Assuming that it pays the farmer to produce at all, it will be profitable for sum to expand output whenever marginal revenue is greater than marginal cost and to keep expanding output until marginal revenue equals marginal cost.

The two rules can also be expressed in terms of three important conditions for the profit maximization behaviour of the farmer. These conditions are:

- (i) For a given output to be the profit-maximizing output, it is necessary that total revenue is equal to or greater than total variable costs. Or, in other words, it is necessary that average revenue (price) is equal to or greater than average variable cost.
- (ii) For a given output to be the profit-maximizing output, it is necessary that at that output  $MC = MR$ .
- (iii) For a given output to be the profit – maximizing output, it is necessary that for slightly smaller output  $MR > MC$ , and that for slightly larger output  $MC > MR$ .

The above conditions can be depicted graphically. Under the competitive conditions as they exist in agriculture, the farmer is a price taker and hence cannot influence the market price. As such the total revenue curve is linear and both average and marginal revenue curves are identical and constant at market price as we have already drawn in Figure 6.11 Conditions (i) and (ii) have been graphically presented in the Figure 6.12.



**Fig. 6.12 Profit Maximizing Output**

In Figure 7.9 output  $Oq_2$  is profit maximizing output because as output is increased up to  $Oq_2$ , each additional unit produced is adding more to revenue than to the cost. If we extend our output beyond  $Oq_2$ , each successive unit of output will add more cost than revenue. Marginal revenue is also equal to marginal cost at output  $Oq_2$ , but  $Oq_2$  is not profit maximizing output because if output is extended beyond  $Oq_1$ ,  $MR > MC$  which is contrary to the condition (ii). Hence, only output  $Oq_2$ , satisfies condition (iii).

#### Check Your Progress

5. Why is the economist's understanding of cost different from that of the accountant?
6. What do you mean by private cost of production?

## 6.5 MEASURES OF FARM EFFICIENCY

On a farm, the main objective of the farmer is to use the scarce resources that leads to its maximization, on a continuing basis, according to the value of gross output or profits or farm business income or operational surplus, subject, of course, to certain utility consideration. The resources used, take the form of land, labour, capital, etc. One would frequently like to know how far, the use of these resources is helpful in achieving the specified objective. As the farm is a multi-product firm, sometimes, it may also be desirable to know how the resources used in the production of different products (crops) are being rewarded and sometimes, the farmer maybe carrying on some activities allied to proper crop production. For example, dairying, poultry farming, piggery, etc. There may be a need to know the competitive returns from these activities vis-à-vis crop production and vis-à-vis each other. Efficiency measures in agriculture are thus important tools of farm management and are used for knowing if there is any scope for improvement in the use of farm resources on the farm as a whole or in certain specific farm

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operations or for comparing the efficiency of one farm with the efficiency of some other farm. Efficiency is expressed as a ratio between some measures of returns and some measure of efforts.

An important set of measures of farm efficiency, in the light of the definition of efficiency as given above, is based upon the concept of ratio. There is also another set of efficiency measures, called 'the aggregate measures'. These are used for measuring some types of returns on the farm as a whole.

**Part I:** The efficiency measures based upon the concept of ratio following efficiency measures are generally used for farm management:

- A. The capital ratios
- B. Income ratios
- C. Cost ratios
- D. Cropping intensity index
- E. Crop yield index
- F. System index

The brief description of these measures is following:

**A. The capital ratios**

These measures are calculated with the help of the balance sheet of the firm.

These measures include:

- (i) Net Capital Ratio =  $\frac{\text{Total Assets}}{\text{Total Liabilities}}$
  - (ii) Working Capital Ratio =  $\frac{\text{Working Assets and Current Assets}}{\text{Intermediate Liabilities and Current Liabilities}}$
  - (iii) Current Ratio =  $\frac{\text{Current Assets}}{\text{Current Liabilities}}$
- Whereas the net capital ratio can be used to measure the relative degree of solvency of the business of various farms in the long run, working capital ratio will indicate the solvency of the farm business for a medium term and the current ratio for a short term period.
- (iv) Ratio between net worth and fixed capital =  $\frac{\text{Net Worth}}{\text{Fixed Capital}}$
  - (v) Debt equity ratio =  $\frac{\text{Deferred Liabilities}}{\text{Net Worth}}$

This measures shows whether the owned resources of the farmer are sufficient to pay for the loans taken from external sources or not. If the ratio is less than one it will imply that farm is in a position to pay of its debts.



$$(vi) \text{ Ratio between working capital and total assets} = \frac{\text{Working Capital}}{\text{Total Assets}}$$

This ratio will help us to know how far the total assets have a reasonable amount of working capital. This can be known by comparing the actual ratio with the normal ratio meant for the type of farm under study.

## B. Income Ratios

The measures are calculated mainly, with the help of the Trading and Profit and Loss Account of the farm.

There are:

$$1. \text{ Rate of turnover} = \frac{\text{Gross income (i.e. value of gross output produced during the accounting period)}}{\text{Total Assets}}$$

When there is a shortage of capital, a higher turnover per unit of total assets will indicate better use of given assets.

$$2. \text{ Net income per acre} = \frac{\text{Total net Income}}{\text{Area of the Farm in acres}}$$

According to Vyas and Tyagi, 'Net Income' is one of the basic criteria for comparing operational efficiency of various farms. However, it need not always be calculated for one unit of area of land. It can also be calculated for one unit of any other input especially labour or, in some cases, even for a unit of total cost incurred in production.

## C. Cost Ratios

- (i) Gross Ratio : (Total expenses) / (Gross Income)
- (ii) Fixed Ratio : (Fixed expenses) / (Gross Income)
- (iii) Operating Ratio : (Opening expenses) / (Gross Income)

Fixed ratio and operating ratio are the two constituents of gross ratio. A higher gross ratio indicates lower efficiency. Gross ratios can only be reduced if the two constituent's ratios are reduced. Fixed ratio can be reduced only by increasing production as fixed costs remain constant. Operating ratio can be reduced by a better allocation of variable resources.

## D. Cropping Intensity Index

Cropping intensity on a farm is found by dividing the gross area sown by the net area sown in any crop year, and then multiplying it by 100. This measure gives us an idea about the extent of multiple cropping taking place on a farm.

## E. Crop Yield Index

This index is meant to see how the yield on a particular farm compares with the average yield in the region as a whole. If it were only one crop, the yield on a

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particular farm could be directly compared with the average yield in the region. The crop yield index becomes necessary because many crops are sown in a year on a given farm, some with yield higher than the average yield in the region and other with yield lower than the average yield. For the construction of crop yield index, the average yield of a crop in the region serves as a base (=100) for computing the yield relative for the crops sown on the particular farm. For example, if the average yield of paddy per hectare in the region is 40 quintals and the yield of paddy per hectare on the particular farm is 50 quintals, the yield relative for paddy for the given farm will be  $50/40 \times 100 = 125$ . Such yield relatives will be found for each crop sown on the farm in question. After the yield relatives have been calculated, weights will be allotted to each yield relative. The weight for a particular crop is equal to area under this crop as a percentage of the total cropped area on the farm under study. Weighted average of the yield relatives will then give us the crop yield index for the particular farm. If this index is greater than 100, this will imply that the particular farm is more efficient than a farm on the average in the region so far as crop yield is concerned. This conclusion, however, will be reliable only if the cropping pattern on the farm is quite similar to that of the region as a whole.

**Adjusted crop yield index**

Crop yield index is based upon the concept of total cropped area and not on the basis of total physical area under cultivation. Sometime, it may be desirable to compare the crop yield per hectare of physical area of land. For that purpose, we correct or adjust the crop yield index for the cropping intensity on the particular farm and on the average farm.

$$\text{The adjusted crop yield index} = \frac{\text{Crop yield index} \times \text{Cropping intensity on the farm}}{\text{Cropping intensity in the region}}$$

**F. System Index**

The crop yield index is used to find out the efficiency of a farm with regard to crop yield when compared with the region as a whole. Here the assumption is that the crop pattern on the farm is very similar to the one for the region as a whole. This assumption, when extended to its logical conclusions, implicitly implies that the crop yield index will be most reliable when percentage distribution of cropped area under various crops on the farm is quite similar to that for the region as a whole.

The system index on the other hand, assumes that percentage distribution of cropped area under different crops on a farm is not similar to the one for the region as a whole. However, the net income yielded per hectare of a crop on a farm is exactly the same as is for the region as a whole. The index is used to find out how much the income on a farm will be different from that on an average farm if, given its own percentage distribution of cropped area under various crops, its

per hectare net income for different crops were the same as for the region as a whole.

For constructing this index, we, in the first instance, find out the relatives for the area under each crop as percentage of the total cropped area on a farm, with total area under this crop in the region as a percentage of total area under various crops in the region, as the base. These relatives are then allotted weights according to the per hectare net income yielded by each crop in the region. The weighted average of the area relatives, then gives us the system index.

### Adjusted System Index:

The system index can also be adjusted for the cropping intensity for the farm and the region in the same way as way done in case of crop yield index.

The Adjusted System Index

$$= \frac{\text{System index} \times \text{Cropping intensity on the farm}}{\text{Cropping intensity in the region}}$$

The index is quite useful for comparing the efficiency of a farm with that of the region as a whole with regard to the cropping pattern in the region.

### Conclusion

The above narration of the efficiency measure clearly shows that one single measure fails to cover all the aspects of efficiency of a farm. Similarly, financial efficiency and production efficiency requires different measures. However, there are certain other yardsticks through which production efficiency is measured. One important point to remember is that for different farm situations (capital intensive or labour intensive), different measures have to be used.

### Part II: Aggregate Measures of Farm Efficiency

As pointed out earlier, there are two sets of measures of farm efficiency namely (a) measures in terms of ratios and (b) the aggregate measures. The aggregate measures, as their name implies, do not involve any type of ratio.

The following section is devoted to the description of the different aggregate measures. Some of these measures are as follows:

- (i) **Gross Income:** This measure shows the size as well as volume of farm business along with the part that can be used for domestic consumption during the same period. It also includes the closing stock of crops after finally deducting from it the value of opening stock of crop at the beginning of the accounting period.
- (ii) **Cash Income:** This is a measure which indicates how much cash a farmer has at his disposal for utilizing for various agricultural improvements. Cash income is found out by adding the total cash sale proceeds and the income earned by hiring out the farm resources and then deducting from it the cash paid out for various farm operations.

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**(iii) Net Operating Income:** This is calculated by deducting various operational expenses, incurred for production during the accounting period from the gross income as defined in gross income. As per convention, operating expenses are inclusive of value of hired human labour, cost of maintenance of owned bullock labour, charges for hired bullock labour, operational expenses of owned farm machinery (including tube wells) except its depreciation, payment for hired machinery, cost of seed, fertilizers, manure and insecticides, canal irrigation charges, taxes (excluding land revenue) depreciation on working assets, miscellaneous charges and rent on leased land.

**(iv) Net Farm Income:** It actually paid out fixed expenses incurred on cultivation like land revenue and the depreciation on fixed assets (like building, machinery and irrigation structure) are deducted from net operating income, one gets what is known as net farm income.

**(v) Net Family Income:** If off-farm income of one of the members of the operator's family is added to net farm income, the resultant is called net family income.

**(vi) Farm Business Income:** This version of income from farm is based upon a concept of cost of cultivation described by farm management authorities in India as cost A1. It is, therefore, necessary to know about various concepts of cost before we describe how farm business income and a few other versions of income are computed.

Following are the constituents of various types of costs used in farm management studies (after 1989).

**Cost A1:** It includes the following 16 items of costs:

- (a) Value of hired human labour (permanent and casual).
- (b) Value of owned bullock labour
- (c) Value of hired bullock labour
- (d) Value of owned machine labour (except depreciation), except that used for irrigation purposes.
- (e) Hired machinery charges, except those used for irrigation purposes.
- (f) Value of fertilizers.
- (g) Value of manure (owned and purchased).
- (h) Value of seeds (both farm produced and purchased).
- (i) Value of insecticides and pesticides.
- (j) Irrigation charges (both owned and hired machines-depreciation on owned machinery used for irrigation is excluded)
- (k) Canal water charges.
- (l) Land revenue, cesses and other taxes.

- (m) Depreciation on farm implements (both bullock-driven and used by human labour).
- (n) Depreciation on farm buildings, farm machinery (including tube wells) and irrigation structure.
- (o) Interest on working capital.
- (p) Miscellaneous expenses (artisans, ropes and repair of small farm implements).

**Cost  $A_2$**  = cost  $A_1$  plus

Rent paid for leased – in land.

**Cost  $B_1$**  = cost  $A_2$  + Interest on value of owned capital excluding land)

**Cost  $B_2$**  = cost  $B_1$  + rental value of owned land (net of land revenue).

**Cost  $C_1$**  =  $B_1$  + Imputed value of family labour.

**Cost  $C_2$**  =  $B_2$  + Imputed value of family labour.

**Cost  $C_3$**  =  $C_2$  \* + 10% of  $C_2$  \* for the managerial and the entrepreneurial functions performed by the farmer.

The CACP considers cost  $C_3$  as the cost of production of a crop, for determining its minimum support price.

On the basis of these costs, we can say that

- (a) Farm business income = Gross Income as defined in (i) minus Cost  $A_1$ .
- (b) Owned farm business income = Gross Income – Cost  $A_2$ .
- (c) Family labour income = Gross Income – Cost  $B_2$ .
- (d) Net income = Gross Income – Cost  $C_3$ .

There is yet another version of income. It is called farm investment income. It is found out by adding interest on owned fixed capital and imputed rental value of owned land to net income.

**(vii) Surplus Over Variable Costs:** This is found by subtracting the total variable costs from the gross income. This is also known as return to the fixed resources.

**(viii) Returns to management:** This is the return which the operator gets for his management services. Superficially, this means that all expenses imputed or actually paid for various inputs (intermediate or primary) belonging to outsiders or to the operator have to be deducted from the gross income. In other words, it should be synonymous with net income as defined above. However, this is not so.

According to Farm Management experts, the returns to management are found by deducting imputed value of family rent for owned land (net of land revenue), interest on working capital, depreciation on fixed assets (like farm

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buildings, farm machinery and irrigation structure and land revenue from Net Operating Income, as defined in (iii) above.

**(ix) Returns to Labour and Management:** Obviously, this measure implies a total earning of the farm operator as an entrepreneur and as the supplier of family labour. As such, we calculate its value by adding the imputed value of family labour to the value represented by returns to management. This measure can be used for comparing the efficiency of labour.

**(x) Returns to Capital & Management:** This measure can be used for measuring the efficiency of capital. It is found by adding depreciation on fixed capital and the fixed expenses to returns of management.

The aggregate measures provide for a comparison between farming as a business and other occupations. The comparison thus helps the farmer to decide whether to stay in agriculture or not. Similarly, through inter-farm comparisons, the farmer can decide about changes necessary in the use of various inputs. Of course, precaution regarding 'comparability' will be necessary in case of inter-occupation or inter-farm comparisons.

### Conclusion

Aggregate measures serve a number of purposes. The farmer has to take one important precaution while comparing the efficiency of his farm with that of other farms or while comparing his farming business with that of another occupation. He must be sure that various features of other farms or of other occupations are not so different from those of his farm, as to make the necessary comparison totally baseless.

#### Check Your Progress

7. What is the main objective of a farmer, on a farm?
8. Which are the two constituents of gross ratio?

## 6.6 SUPPLY RESPONSE IN AGRICULTURE

Progressive agriculture, as it is pointed out, can serve as a powerful engine of growth. One important way through which agriculture promotes the development of the non-agricultural sector is by supplying its products-both food and fibre to the latter. Food and fibre crops should flow in ample quantity to the non-agricultural sector, if the physical output in the non-agricultural sector is to grow smoothly. In developing countries, many steps can be taken for increasing agricultural production as well as for encouraging the flow of crops produced, to the market. Changes in the price level of various agricultural crops in the correct direction have been suggested as one of these measures. It is expected that suitable changes in prices of various crops will bring about an increase in agricultural production as well as in

the quantity of crops supplied to the market. These countries make it necessary to make a detailed examination of this suggestion. Such an examination is necessary due to the following reasons such as, developing countries, a serious controversy about the impact of changes in prices, on production of agricultural crops as well as on their flow to the market has been raging in the academic circles and it will be very difficult to arrive at any acceptable conclusion in this regard, without dabbling into this controversy. The controversy has appeared because of three different views about the impact of price changes on the supply of agricultural products. These are:

- (a) **Supply response of agricultural products to change in price is normal:** This implies that higher prices will imply more supply of agricultural products.
- (b) **The supply curve for agricultural products is back ward sloping:** This means, that after a point, the supply of agricultural products falls when their prices rise.
- (c) **There is no relationship between prices of agricultural crops and their supply:** The supply is influenced by other social, economic and technical factors.

#### A. Different views that farmers respond normally to price changes.

- (i) **Price changes and agricultural production:** This view implies that if farmers are offered higher prices for their crops, in order to benefit from the new opportunities, they will increase the production of these crops. However, if the prices offered decline, the farmers will reduce the production of the crops. One of the most serious protagonists of this view is T.W. Schultz, who in his epoch-making book *Transforming Traditional Agriculture* emphasized that the farmers in traditional agriculture, though poor, are efficient. By the term 'efficient' he implied that the farmers allocated their resources so efficiently that marginal costs and marginal returns, for various inputs used in producing various crops were equal to each other. Such an efficient allocation of resources would not have been possible if the farmers had not responded normally to price changes, i.e., price had gone up and less of those crops whose prices had gone down. He further emphasized that farmers, in traditional agriculture will accept a new factor of production and produce a crop by that factor only when it was more profitable, as compared with the existing ones. This assertion again implies a firm conviction on the part of Schultz that farmers in traditional agriculture respond normally to price changes as well as to other incentives. He has quoted a few economists like Sol Tax and David Hopper to support his contention.
- (ii) Studies by Indian Economists like Dharam Narain, Raj Krishna, Tyagi and many others have also shown that farmers, in underdeveloped countries, change the area under various crops in response to change in prices, in a positive way.

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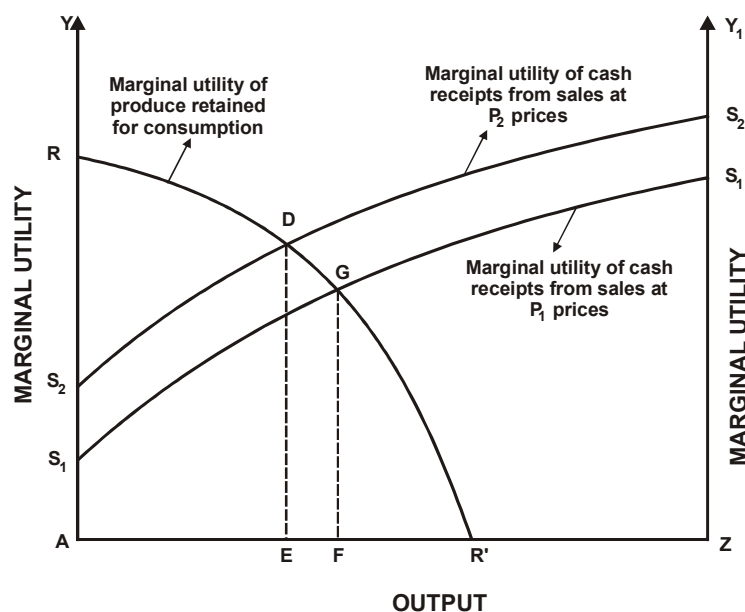
Raj Krishna's study also shows that price elasticity of production of rubber is also very low. This is mainly explained by the fact that rubber is a perennial crop and its production cannot be changed easily when its price changes.

In fact, one economist, John W. Mellor has concluded that short-run (positive) responses to price changes in underdeveloped agriculture may be greater than those in developed agriculture. This is so because certain factors of production such as capital, technical knowledge and the managerial skills are somewhat less sophisticated and less specific in a backward agriculture than in a developed agriculture, and, therefore, can be used to increase the output of any crop, is so needed.

The conclusion of the above discussion is that, in general the response of production of a crop to a change in its price, other things remaining the same, is normal i.e., with an increase in the price of a crop, its production will increase, and with a fall in price, its production will go down. Of course, it is quite possible that the degree of response may not be the same in all cases.

**(iii) View that marketed surplus responds positively to price changes:**

Some economists like Khustro, however, do not link the amount marketed with the amount produced. Rather, they try to prove the positive relation between prices and the amount marketed, independently of whether the production of the crops increases or decreases when their prices change. They have tried to show that higher prices also tempt the producers to part with a greater part of the stock of the crop that they have already produced. In other words, marketed surplus increases as the price rises. Khustro used the following diagram (Figure 6.13) to explain this point.



**Fig. 6.13** Market Surplus increases as Price Rises



Suppose AZ is the total amount of food, grains produced by a farmer. Curve RR' with A as origin indicates the marginal utility if the food crop is domestically consumed. Curves  $S_1S_1$  &  $S_2S_2$  with Z as origin, indicate the marginal utility from the money obtained by selling the crop ZA when price of the food crop is say,  $P_1$  and  $P_2$  respectively, price  $P_2$  being higher than the price  $P_1$ .

If price is  $P_1$ , the two curves, namely RR' and  $S_1S_1$  intersect at G, i.e., the marginal utility obtained by domestic consumption and that obtained from money received through the sale of the crop are equal to each other at G.

This, in other words, means AF amount will be consumed and ZF will be sold in the market if the farmer is a rational person and wants to maximize his total satisfaction. Now, if price of the food crop goes up to  $P_2$ , equilibrium will be at point D which means that out of the same amount of crop, AE will be consumed domestically and EZ will be sold in the market. Similarly, it can also be proved that the marketed surplus of a crop will fall if its price declines.

**B. View that production and marketed surplus of Crop/Crops are inversely related to prices.**

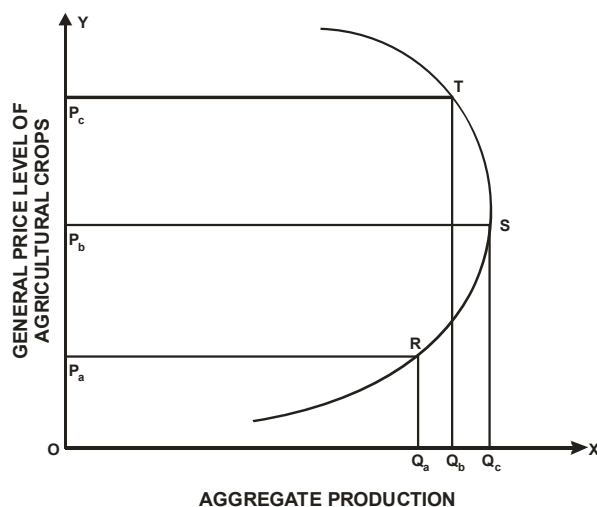
The strain of the preceding paragraphs is that the response of production of agricultural crops as well as that of the quantity of crops marketed to changing prices is positive. Higher prices, in other words, lead to higher production and also result in greater quantity of crops being marketed. However, it was observed that during the Great Depression of 1929-32, exports of agricultural commodities, from some backward countries, increased despite a fall in the prices of these products. This led some economists to believe that supply response of agricultural commodities to changes in prices may be inverse in case of backward agricultural economies. For their theoretical explanation, they have assumed that agriculture is completely traditional in character. It is highly labour-oriented and stagnant. It is also assumed that (a) either the non-agricultural sector is completely non-existent and therefore there is no purchase of agricultural inputs or of consumer goods from the industrial sector or (b) that the non-agricultural sector does exist, but the consumption pattern of the farmers (also covering goods & services supplied by the non-agricultural sector) is totally tradition bound and therefore, is not likely to change even when their income due to any reason goes up (The latter assumption has been made by Mellor).

- (i) **Negative response of production to price changes:** Many reasons have been advanced to explain the inverse relationship between the prices of agricultural products and their production in a traditional agriculture.
- (ii) The First explanation for the possible existence of a backward sloping supply curve (with reference to aggregate production) in an underdeveloped agricultural economy is that a backward agriculture is generally labour

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intensive, and that the supply curve for labour in a backward agricultural economy is itself backward sloping. In such a case, when the prices of agricultural commodities increase, income (i.e. wages) of the agriculturists (supplying their labour) will increase. Labour supply will, accordingly, decline and, therefore, there will be less output. Mellor tries to explain the reasons for backward sloping supply curve for labour in a backward agriculture. He brings into the discussion the (a) concept of substitution effect of higher prices of agricultural crops on the use of labour on farms as against its non use i.e., leisure and (b) the concept of income effect on use of labour. He concludes that due to higher prices of agricultural crops, there is, obviously a temptation, on the part of farmers in traditional agriculture, to use more labour, to increase production on their farms (wherever it is possible). This is the positive substitution effect. However, higher incomes caused by higher prices of agricultural crops will also, at the same time, discourage the use of labour on the farms simply because the additional income cannot be gainfully utilized by the farmers because of a tradition bound and inflexible consumption pattern. This is the negative income effect. A point will ultimately arrive beyond which the negative income effect of higher prices will over-neutralize the positive substitution effect of higher prices on labour use. The supply curve for labour and therefore, also for aggregate agricultural production will start bending backwards after that point. The following Figure 6.14 shows the backward sloping supply curve for aggregate agricultural production.



**Fig. 6.14** Backward Sloping Supply Curve for Aggregate Agricultural Production

It is clear from Figure 6.14 that as the general level of agricultural prices rises, agricultural production rises (of course, with a time lag) but only up to a certain point. If the prices continue to rise beyond that point ( $P_b$  in the diagram) agricultural production does not increase. Rather, it starts

decreasing with every successive rise in agricultural prices. In other words, the supply curves starts moving backwards.

Bohannan & Dalton as well as Joosten refer to quite a number of studies pertaining to Africa which show a backward sloping supply curve in production because of the reasons stated above. However, the methodology adopted in these studies is rather questionable.

- (iii) **Inverse relationship between prices and Marketed Surplus:** The inverse relationship between prices and the amount of crops marketed has been explained in many ways.

The first reason put forth to explain this inverse relationship is based upon the same logic as was used by some economists to explain the positive relation between prices and the amount of crops marketed. It has been observed that if the total agricultural output falls due to the increase in agricultural prices, the amount of crops marketed will automatically do down because of a rise in the agricultural prices and the consequent fall in agricultural output.

The second reason used to explain the inverse relationship between prices and the amount of agricultural crop/crops, is based on the hypothesis that the farmers in a backward agriculture have fixed or nearly fixed monetary obligations and sell only as much of their produce as is necessary to obtain the desired money income. The nearly limited desire for money is explained by an almost fixed requirement of manufactured goods, purchased by these farmers and rather fixed charges for rent, debt services, etc. The portion of output that need not be sold to meet the demand for cash has high marginal utility for the subsistence farmers because of its short supply. Based on this logic, it is argued that any increase in prices will bring a fall in the marketed surplus as a smaller amount of crops will now enable the farmers to meet their monetary obligations. The surplus sold by the farmers has been called 'distress marketed surplus,' and will go down if the prices of agricultural products rise.

### **C. The view that supply of agricultural crops is incentive to price changes.**

The advocates of this view hold that, in a backward economy there are many social and institutional constraints which insulate the production of a crop as well as its sale in the market from the impact of a price change. They feel that conservatism of the farmers, their faith in customary production of crops, production of crops mainly for domestic consumption, their limited knowledge, limited wants, rigid tastes- all inhibit the change in crop pattern when prices change. The fact that in many backward economies, the average size of the farm is too small and the farmers have generally nothing to sell in the market, works in the same direction. Further, inadequate transport facilities and defective system of agricultural marketing

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and the market imperfections in the form of oligopsony resulting in the exploitation of the farmers, also discourage the dependence of the farmers on the market. To that extent, the impact of price changes on the supply of agricultural commodities is also reduced.

According to the advocates who believe that the supply of agricultural crops is incentive to price changes consider it to be a variable affecting the production or sale of a crop. But in a backward economy, the factors against production or the amount of crop/crops marketed against price changes are quite strong. As such, a change in the prices of various crops will fail to show its impact on production or sale of these crops.

Mellor feels that a situation can arise even in case of modernized agriculture where changes in the prices of different crops may not be followed by a change in the crop pattern. (not because of social or cultural factors). This is because capital in modern agriculture can be specific. Cost of replacement of machinery may be too high and may result in a major rigidity in the response of supply of certain crops to change in their prices. There is, according to him, a higher flexibility in crop production in response to price changes in low income agriculture.

### **D. The sources of difference in the discussed three viewpoints.**

It is clear that each one of the viewpoints mentioned earlier is based upon some convincing arguments before arriving at any logical conclusions. However, it will be wrong to infer that each version is totally correct. If it were so, it would be very difficult to reconcile, the diametrically opposed conclusions arrived at, by the advocates of these views. The fact of the matter is that these advocates take only a particular situation into account; look at it from a particular angle and then arrive at a conclusion which appears to be totally unobjectionable. It appears to be quite similar to the situation where four blind people are describing a complete elephant by touching only a part of it.

We feel that a better insight into the relationship between (a) prices and production of crops and (b) prices and sale of crops can be achieved if we focus our attention at the main situations considered by the proponents of these views, and identify the factors that strengthen or weaken the relationship between prices and the supply (production or sale) of agricultural crops. In our view, price is only one of the factors influencing the production of an agricultural commodity or its sale in the market. Further, in our view, the relationship between them is normal. This is what the behaviour of a rational farmer, will always ensure. However, there are simultaneously in operation, other factors also which sometimes strengthen and sometimes weaken this relationship. The observed relationship between price of an agricultural crop and its supply appear to be confusing simply because other factors, though in operation, are ignored by the analysis of different situations. Most of these analysts did not, at all, try to isolate the effect of factors, other than the price of agricultural crop, on the supply of the given crop. If they had done so

and at the same time, had used the right type of tools for analysis, the relationship between the price of an agricultural crop and its supply would definitely have turned out to be positive. It is therefore necessary to know about the factors other than the price which can affect the supply of the crop, in one way or the other. Once these factors are kept in view while going through the conclusions revealed by the study of an economic analysis, it will be easy to know the reason why in a particular situation, the relationship between the price of a crop and its supply are found to be not normal. Some of the factors are as follows:

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- (i) **Production Response of all Crops V/S Production Response of a single Crop:** Relationship between the change in the price of one single crop and its production is stronger than the relationship between all prices and all crops taken together. It is easier to increase the production of a crop by diverting land from one crop to another if the price of that crop rises. This may be true even for a bunch of crops produced together as well, if the land for diversion is available. However, if the prices of all crops are increased simultaneously, temptation to change the area under any particular crop through diversion of land from other crops will be weakened. And in such a case, not to speak of any increase in the production of all crops, there may be no increase (or only marginal increase) in the production of any particular crop. This will be true especially when there is no extra land available for cultivation. Mellor's conclusions in this regard are quite interesting. His analysis shows that in traditional agriculture, whereas supply curve for aggregate agricultural production has a negative slope after a point, the supply curve for one individual crop slopes positively throughout.
- (ii) **Absolute change in prices and relative change in prices:** While studying the impact of change in the price of a crop on its production, one should always consider the relative change in its price and not the absolute change in it. If the absolute prices of various crops change but the price ratios for various crops remain unchanged, there will be no or only a negligible change in the production of any crop. (We assume that neither additional land is available for cultivation, nor a new technology has simultaneously become available for any crop, and that the change in crop pattern takes place only through diversion of land from one crop to another).
- (iii) **Stage of Economic Development:** Though some economists like Schultz and Raj Krishna have pointed out that the response of production of individual crops to price changes is equally strong both in underdeveloped as well as developed economies, they seem to be only superficial in their analysis. It appears that they have failed to realize that even underdeveloped as well as developed economies, they seem to be only superficial in their analysis. It appears that they have failed to realize that even underdevelopment has different stages and one of these stages is where the industrial sector is not at all developed and the villages are self-sufficient in themselves. In such

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a case, the normal relation between prices and the production of crops will be very weak. The relationship between a general increase in agricultural prices and production will, in fact, as Mellor says, be inverse. Why should the farmers produce more if the additional amount is not to be sold in the market? And, in fact, they will not be tempted to sell the additional amount if at all produced, because they cannot purchase any non-agricultural commodity due to the non-development of the industrial sector. The case of normal response of agricultural production or the amount sold to price changes assumes the existence of an industrial sector (internal or external) and also of the peasantry interested in purchasing more and more of the industrial products.

- (iv) **Period for which the response is considered:** Even when the response of production or sale of the crops to price changes is normal, its intensity will depend upon the period taken into consideration. Change in the price of a particular crop may cause no response at all in its production if the price change takes place during the crop season itself. If the price change continues for a longer period; and the period allowed for the production of the crop to change through a change in area under it, is thus prolonged, a positive response may be observed.
- (v) **Distinction between response in production and response in amount offered for sale in the market:** Normally under given circumstances, the response of production and the amount offered for sale should be in the same direction. However, there might be a situation where production of a crop may respond to change in its price normally, while the amount offered for its sale may not, and vice versa.
- (vi) **Commercial crops V/s Subsistence crops:** Even when the response of production or of the amount of a crop offered for sale is normal; its degree will differ according as the crop is produced mainly for domestic purposes or for the market. The reason for this difference is obvious. Commercial crops are produced for earning profits and a higher price will mean higher profits and therefore, encourage the farmers to produce more and also to sell more. On the other hand, crops usually produced for domestic consumption will need a relatively bigger increase in their prices if their production is to be increased or the amount to be increased further. In other words, supply response to change in prices will be weaker for the subsistence crops as compared with that for the commercial crops.

Production of perennial crops is likely to show a response to change in prices which may appear to be rather chaotic. In a very short period of say, a year or so, their production response may be less than that of the subsistence crops. If the changed prices are allowed to stay for a much longer period, the production response of these crops are likely to be greater than that of the subsistence crop.

- (vii) **Size of the farm:** It is the farmer with a farm greater in size than what is required to meet his own needs who produces for and sells in the market. Only such a farmer will react positively under a normal situation, to price changes. Small farmers will remain incentive to these changes. Small farmers will remain incentive to these changes. So, whether the agriculture in an economy is characterized by large farms or small farms, will be another factor affecting the overall supply response of agricultural production or of marketed surplus to price changes.
- (viii) **Problem of time lag:** Producers of all types of crops whether perennial or non-perennial respond positively to price changes. However, the time taken for the supply of a crop to change in response to a change in its price will be different in case of different types of crops. In case of in annual crop, the supply (production) may change after one crop season. In case of a perennial crop, the supply may change after some years. Of course, in both cases, the response is there, but it is a lagged one. So, before studying a relationship between the price of a crop and its supply, the time lag involved between the change in its price and the change in its supply must be taken into consideration. In case, the time lag is ignored or is not correctly estimated, the relationship between the change in the price of a crop and the change in its supply, in an empirical study, may appear to be non-existent or even negative.
- (ix) **Problems on the supply side:** Change in the production of a crop (for that matter, or any commodity) in response to a change in its price, will fully materialize only when no factor, operating on the supply side, obstructs as such a change. This, in other words, implies that if production of a crop is to be increased, there should be an ample supply of necessary physical inputs like seeds, fertilizers irrigation, and of credit, proper knowhow, etc. In their absence, production of a crop may not increase at all or may not increase sufficiently when its price is increased. This has been the case in India itself where after 1965-66, a positive price policy evokes different supply responses for wheat and rice from different regions of the country (due to difference in irrigation facilities) and a rather poor supply response for crops other than wheat and rice in all regions (due to non-availability of improved seeds for them).
- (x) **Social characteristics of the society:** Conservatism, rigid tastes, limited consumption, needs of farmers, their fatalism, etc., all weaken the profit motive of the farmers and therefore their response to changes in the prices of agricultural products. Further, agriculture, as we know, is a source of income as well as a way of life. In case of those who have adopted agriculture only as a way of life, changes in the prices of agricultural products draw rather negligible changes in agricultural production or marketed surplus. Business motive of such people is very weak.

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The preceding description of various factors, strengthening or weakening the relationship between the prices of agricultural crops and their supply clearly brings out the fact that at the empirical level, various situations will not reveal a uniform pattern of relationship between prices and supply of various crops. Each situation is unique in itself. Of course, if through correct statistical analysis, the effect of all factors, other than prices, on agricultural production or on the amount offered for sale is eliminated, a positive relationship between the two variables is likely to emerge. However, in the case of studies carried so far in this regard, weakness in statistical analysis has been a common malady and has only added to the confusion that the situational variations had created with regard to the relationship between the prices of agricultural crops and their supply.

Furthermore, the foregoing analysis, besides explaining the reason for the controversy about the nature of supply curve in agriculture, also points to an important policy implication. It is that if it is proposed to manipulate the prices of agricultural crops with a view to changing their supply in the positive direction, many other supplementary measures like provision of physical inputs, credit, information about new technology, efficient marketing system, etc., should accompany such a policy. Non-price measures, necessary for strengthening the business motive of the farmers have also to be adopted. Moreover, a developing non-agricultural sector and the increasing availability of its products to the agricultural sector will prompt the farmers to produce more and sell more, so as to improve their own standard of living. Mere changes in agricultural prices, by themselves are not likely to elicit the desired positive response so far as the supply of various crops is concerned.

**Check Your Progress**

9. What did T.W. Schultz emphasize in his book, *Transforming Traditional Agriculture*?
10. What is the belief of advocates who view that supply of agricultural crops is incentive to price changes?

**6.7 FARM SIZE AND PRODUCTIVITY DEBATE**

The debate regarding the relationship between size of the farm and productivity has been taking place, both at the theoretical as well as the empirical plan. While some tried to show through 'a priori' reasoning that an inverse relationship was likely to exist between the size of a farm and productivity, some economists made use of the 'farm management studies' data collected during the fifties as well as



some other data, to arrive at the conclusion that an inverse relationship existed between the size of the farm and productivity.

*Farming System*

### **Large vs. Small-Size of Farm**

Should farming be done on a large or small-scale basis is a vital question and answer to this is tied with the goals and capabilities of the farmer. As in manufacturing industry, in agriculture, too, we have some advantages of large-scale farming. These advantages stem from technical, financial and marketing economies.

Large-sized farms are more economical in working and conducive to greater efficiency than the small-sized farms. It is because all the technical advantages open to small sized farms are also open to large-sized farms but all advantages open to large sizes farms are not open to small-size farms. It has been observed that large farms benefit from the following factors:

- Economies of production
- Management
- Finance
- Marketing

These large farm economies assist in reducing the cost of the farm and also increase efficiency.

Production economies will be reaped by the large-sized farm on account of:

- (a) use of up-to-date and most automatic machines,
- (b) advantages of division of labour and specialization,
- (c) better utilization of byproducts,
- (d) facility of repair and maintenance, and
- (e) benefits of research

Technical and managerial economies also result from the possibilities of a more effective utilization of the available supplies of the three factors of production. 'It follows that on the larger farms, a higher proportion of the capital and of the land is available for direct productive use with a consequent reduction in overhead costs per unit of product produced. This should be of particular importance in agriculture which is an industry where the fixed over head charges tend to form a disproportionately high part of total production costs.'

Marketing economies arise from the facilities for buying and selling on a large-scale. While buying the agricultural inputs, large farmer gets preferential treatment in prices, in discount and rebates because the seller while supplying the inputs in bulk care effect saving in transport, in handling and packing and in bookkeeping. Corresponding advantages accrue to the large farmer when he, in turn, is the seller. Further bulk supplies of large farmer make it possible to practice

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some measure of grading, which can fetch a higher average price for all the goods he sells.

Similar economies of scale occur in the financial sphere on account of the better creditworthiness of the large farmer. He is generally able to borrow money and obtain credit with greater ease and at less expense. Further, due to bigger turn-over and greater total profit, a large farmer is better placed as far as self-financing is concerned.

Another advantage of large farms lies in the opportunity they give to reduced labour costs by putting each worker to the task to which he is most suited, and so take the maximum advantage both of natural aptitudes and that of acquired skill and speed which comes constantly with performing the same operation.

But if the size is extended beyond a limit, some of the resulting economies discussed above tend to be offset by inefficiencies. The preoccupation of farming with living things, the dependence on season and weather, the dispersal of labour over large source areas and the absence of continuous routine activities present a set of conditions in agriculture which come in the way of reaping the economies of large-scale production. As the farm size increases beyond a certain size, the difficulties of supervision and organization decrease the efficiency of a large farm. The size will be so large relative to the managerial input or ability that cost per unit increases. Technical advantages of large-scale production in manufacturing as well as in farming are more pronounced where the work is done with expensive large machines and with a large staff of workers. But in those spheres, where personal attention to detail and intimate care to each activity is desirable, the advantages are with the small producing unit. Most operations in efficient farming, as we know, require intimate care and personal attention with growing crops and with living animals. This places the small family farm employing little or no hired labour in a favourable position. Not only does the financial interest of the family workers ensure the qualitative intensity of their work, but the more intimate relationships existing on small farms also ease the supervision of any hired workers that may be employed. Moreover, family labour is much higher on small farms as compared to large farms. This greater intensity of labour use keeps the productivity of small farms higher than the large farms.

Some other explanations explaining this phenomenon are as follows.

According to Khusro, Sen, Hanumantha Rao and Jagdish Bhagwati, fertility is higher on small farms as compared to large farms because 'as farm size expands, the proportion of bad and indifferent land to total land increases, thus, in turn accounting for the decrease in per acre output and farm income.'

Krishna Bhardwaj, Khusro, Deepak Muzumdar and Usha Rani are of the view that small farmers make more intensive use of their inputs and provide better and more efficient management. This is because of the fact that the mere survival of small farmer is linked with the returns he gets from his small holding. So the

small farmers leave little land fallow, provide intensive inputs to their small holdings and use their land for multiple cropping.

According to Krishna Bhardwaj, there is a higher intensity of irrigation on small farms. In her study, she found a statistically significant inverse relation between the level of irrigation and the size of holding.

According to Prof. Hanumantha Rao, productivity on small farms may be higher due to the fact that large farmers give more preference to leisure as they are not faced with economic compulsion as is the case with small farmers.

The above hypothesis was vehemently opposed by Ashok Rudra who joined the debate in 1968. In a series of two articles entitles, 'Farm Size and Yield Per Acre' and 'More on Returns to Scale in Indian Agriculture,' which appeared in the economic and political weekly of July 1968 and October 1968, Rudra argued that while such inverse relationship farm size and productivity may exist in certain areas, it is not a universal phenomenon and, therefore, cannot be said to operate in all parts of the country. According to Rudra one may emphasize that the inverse relationships were not observed in the context of Indian agriculture. Rudra lays emphasis that such a relationship cannot be regarded as a universally valid law operating in Indian agriculture and that indications from the Farm Management Survey data itself which suggested that instead of declining with increase in size, it might be actually increasing yield per acre.

It was also observed that there was not one systematic pattern of dependence between yield per acre and farm size.

In the same manner, Prof. A.P. Rao and Krishna Bhardwaj have expressed their doubts about the hypothesis of inverse relationship between farm size and productivity. Prof. Rao reached the conclusion that contrary to the findings of the Farm Management studies, according to the present study, productivity remained constant over all holding sizes in all the villages which indicates that holdings size has no effect on productivity.' Krishna Bhardwaj who carried tests on grouped data and fitted logarithmic straight lines to the data pertaining to the earlier round of Farm Management Surveys, concluded that there is no significant or systematic relationship between the acre yield of individual crops and the size of holdings.

There are some studies that which speak against the inverse relationship. However, these negative comments are less than those that have established it, Therefore, universality of the inverse relationship may not be accepted as established but, nevertheless, greater evidence being for it can also not be challenged.

The experience gained after the introduction of new agricultural strategy, too, does not support the above hypothesis. Some recent studies on the hypothesis of inverse relationship between farm size and productivity in the context of recent technological development taking place in the agricultural sector have come out with the results that go contrary to the above hypothesis.

Rajvir Singh and R.K. Patel conducted a study in Meerut district of Uttar Pradesh. To examine the relationship between output and farm size, a function of

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the farm  $Y = axb$  was fitted where Y may be taken as output per standard hectare of total output of the farm. Rajvir Singh and R.K. Patel concluded from their regression analysis that according to the context of new technology, there is no indication of decrease in output per hectare with an increase in farm size and, therefore, the hypothesis of inverse relationship is rejected in the area under study. One possible explanation for this trend is that, as farm technology undergoes a change; large farmers take greater interest in using land more intensively with modern inputs at the proper time in the wake of higher profitability offered by the new technology.

Based on the data derived from different sources, C.H. Hanumantha Rao reached the following observations. According to his observations irrespective of better access to resources, the output per acre in reference to large farms was lower than that of small farms under the traditional labour-intensive technology. This occurred due to the cost of (hired) labour, which was higher for them than for small family farms. Not only was the cost of hired labour more for small family farms but managerial and supervisory diseconomies of larger size under labour-intensive methods accounted for lower labour input per acre among large farms. Technological changes created new production possibilities for large farms that could now increasingly substitute capital for labour by adopting biological as well as mechanical techniques and produce output at a faster rate than small farms. The latest evidence shows that the inverse relationship between farm size and output per acre found under traditional technology no longer holds true with the adoption of new technology.

Rudra also agrees that in most regions of India for which data are available, small farmers seem to cultivate their lands more intensively in the sense that they put in more of labour per hectare and more of non-labour material inputs per hectare; they seem to arrange for irrigation for a greater proportion of their land, so for a multiplicity of crops, and choose among crops those that are more remunerative. As per Rudra, these are not universal laws but these features occur in different combinations in different parts of the country. Rudra also agrees that a poor peasant by his very position is at a disadvantage compared to the bigger farmer in so far as his capacity to apply capital and other monetized inputs is concerned. As the new agricultural strategy is highly-capital intensive, even after all the efforts, the small farmer's output per hectare on his farm may not be larger than on the farms of bigger farmers. Researches are still going on in this direction. From the above discussion, a very confusing picture emerges. It is amazing that from the same set of data, different economists have drawn different conclusions applying different statistical techniques. However, recently, the two rivals in the debate, Prof. A.K. Sen and Prof. Ashok Rudra, have attempted a synthesis of their views. Both have now come agree that:

- (i) The negative relation may hold good in certain parts of the country at particular times but not everywhere and not at all times;

- (ii) Inverse relationships are mostly evident in small-size class. Therefore, when inverse relationships hold, it may only do so in certain ranges and not in every case.
- (iii) Most of the times inverse relationships are confirmed rather than rejected. However, to consider inverse relationships an empirical generalization for Indian agriculture would be a grave error.

By and large, it may be accepted that small farms of economic size are more efficient than large-sized farms. Even though some studies have brought out evidence against the inverse relationship, these are fewer than those that have established it. As such, the universality of the inverse relationship may not be accepted as established but, nevertheless, greater evidence being in favour of it, it can also not be challenged.

### **Inverse relationship and Green Revolution**

The capital intensive technology basically characterizes the Green Revolution in agriculture. It is known to have opened up many avenues to farmers for growth. Many empirical studies in the field of inverse relationship have been conducted with respect to farm size and productivity. Most studies view the weakening and disappearance of inverse relationship to regions which have been open to new agricultural technology. This reasoning evolved as many economists feel that small farmers also have some major advantages over large farmers. For instance, labour-intensive techniques which can be expected to counter-balance or even supersede the capital-intensive techniques which are employed by large farmers in situations of unequal access to capital resources. Even Saini (1971) who in his works has confirmed and generalized the inverse relationship in Indian agriculture on the basis of the results of disaggregated farm management studies data maintains that under the impact of Green Revolution, one would expect the inverse relationship to undergo a change and cease to be true at least in the areas which have experienced the Green Revolution. Hanumantha Rao has shown the weakening and even disappearance of the inverse relationship between farm size and output per acre by comparing the relationship under the traditional technology in the fifties with that under the new technology in the late sixties in Muzaffarnagar (U.P.), Ferozepur (Punjab) and West Godavari (Andhra Pradesh). According to him, the inverse relationship was statistically significant in the fifties in all the districts. However, in the sixties, with the adoption of new agricultural strategy, the inverse relationship was weakened very much in Muzaffarnagar, the regression coefficient having been progressively reduced from -0.25 in 1955-56 to -0.04 in 1968-69. In the case of Ferozepur and West Godavari, the correlation became statistically non-significant.

Prof. Madhusudan Ghosh conducted a study to test the Reversal of the Inverse Relation (RIR) hypothesis by comparing the relationship for all crop production as well as for individual crops under the traditional technology in the mid-fifties with that under the new technology in the early seventies in the Hooghly

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district (West Bengal). He made use of the aggregated Farm Management Survey data. The reversal of the inverse relationship was also confirmed by the results of the estimated relationship for individual crops before and after technological change.

Two hypotheses, according to Ghosh, can be offered as an explanation of the reversal of the inverse relationship.

- (i) Superior technique of production used by the large farmers (quantity-based explanation); and
- (ii) Large farmers put in more of material inputs per hectare than the small farmers (Intensity based explanation).

We, thus, find that after the introduction of new agricultural technology in Indian agriculture since the mid-sixties. The relationship between farm size and productivity has undergone a basic change. The inverse relationship has now yielded place to a positive relationship.

**Farm Size and Profitability**

An important question in respect to small-sized holdings is about their efficiency. Compared to large-sized farms, small farms are generally found to be inefficient in the sense that these are unremunerative. This debate was initiated by Amartya Sen who believes that family labour employed in agriculture is given an imputed value which is in terms of ruling wage rate, thus ceding Indian agriculture to be unremunerative. According to Amartya Sen, the profitability of agriculture increases with the size of holding profitability being measured by the surplus of output over costs which are inclusive of imputed value of labour. But Saini does not agree with Sen. Analyzing the farm management data for Uttar Pradesh and Punjab, he found that the marginal value product of labour was not only positive but was also higher than the labour costs. Saini observed the following facts:

- (i) A good proportion of even the smallest sized farms showed positive profits;
- (ii) Losses are to be found not only in small sized farms but also in bigger land holdings;
- (iii) Size classes show loss in one year but frequently profit in another year.

**Policy Implications**

The controversy regarding the inverse relationship between farm size and land productivity is not merely one of academic interest but of fundamental significance from the point of view of economic policy. Important questions involved in this regard are the choice between small family labour based peasant farms, large hired labour based capitalist farms and large farms with co-operative type of organizations. Policy implications would differ depending on whether we treat the inverse relationship as an indication of higher efficiency of small farms or regard the phenomenon as reflecting conditions of stress of small farms. In case we accept the former position, we would recommend measures to effect the transfer of land from the big to the small and medium farms through sales and through the tendency

on a commercial basis (Hanumantha Rao) or argue like Dandekar that for India the capitalist form of wage-labour organization will lead to inefficient aggregate output and the peasant family system implied by individual peasant proprietorship would be superior.

By and large, it may be accepted that small farms of economic size are more efficient than large size farms. These also promote social harmony in the countryside. Promoting large farms would render small farms weak in their competition against large farms and may create distress among the latter and may even lead to the disposal of small holdings in distress. This would swell the already large army of landless labourers in the country.

### Returns to scale and the inverse relationship

Size-productivity relationship is essentially a relationship between output on the one hand and a single input i.e. land, on the other. From this relationship, some economists tried to draw inferences about the nature of returns to scale in Indian agriculture. In other words, it was suggested by some economists that in the pre-Green Revolution in India, returns to scale in India agriculture were of a decreasing nature. This however, is erroneous for, the returns to scale are indicated by sum of and not by the returns to one single input, say, land. Some economists did try returns to all the inputs taken together, using the farm management data. Their conclusions that (a) returns to one variable input (say land) declined denoted that the returns to scale in Indian agriculture were found to be constant are valid in themselves and are quite compatible with each other. Khusro and Saini have arrived at both of these conclusions.

So, we can conclude that profits per acre seem to be increasing as the size of the farm increases whatever be the state of technology in agriculture, or in other words, large farms are more efficient than the small farm. However, there is a difference of opinion about the reasons for this trend.

#### Check Your Progress

11. How are large-sized farms better than small-sized ones?
12. Which factors benefit large-sized farms?

## 6.8 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Farm management may be defined as a process of managing farming activities to accomplish the desired objectives.
2. The four main tools of farm management are the following:
  - i. Production functions
  - ii. Farm planning

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### iii. Budgeting

### iv. Linear programming

3. The few important farming organizations across the world are as follows:

- Peasant family farming
- Capitalistic farming
- State farming
- Collective farming
- Cooperative farming

4. The chief feature of peasant farming is the small size of the farm that has to be cultivated.

5. The economist's understanding of cost differs from that of the accountant. It is different because the layman's concept of costs tends to be closer to the concept of cost used in accountancy. The primary concerns of an accountant are paid-out costs, such as wages, seed bills and purchase feed. On the other hand, the economist is interested in imputed costs which can be defined as the costs pertaining to the farmer's own labour, feed for livestock grown on the farm, etc, which are not covered by any monetary transaction, and yet do represent a use of real resources, which might have been used to produce something else.

6. Private cost of production refers to the individual farmer and would include explicit costs (actual money expenses directly incurred in raising a farm commodity plus the monetary estimates of implicit costs).

7. On a farm, the main objective of the farmer is to use the scarce resources that leads to its maximization, on a continuing basis, according to the value of gross output or profits or farm business income or operational surplus, subject, of course, to certain utility consideration.

8. Fixed ratio and operating ratio are the two constituents of gross ratio.

9. T.W. Schultz in his book *Transforming Traditional Agriculture* implied by term 'efficient' that the farmers allocated their resources so efficiently that marginal costs and marginal returns, for various inputs used in producing various crops were equal to each other.

10. Advocates who view that supply of agricultural crops is incentive to price changes believe that in a backward economy there are many social and institutional constraints which insulate the production of a crop as well as its sale in the market from the impact of a price change. They feel that conservatism of the farmers, their faith in customary production of crops, production of crops mainly for domestic consumption, their limited knowledge, limited wants, rigid tastes- all inhibit the change in crop pattern when prices change.



11. Large-sized farms are more economical in working and conducive to greater efficiency than the small-sized farms. It is because all the technical advantages open to small sized farms are also open to large-sized farms but all advantages open to large sizes farms are not open to small-size farms.
12. It has been observed that large farms benefit from the following factors:
  - Economies of production
  - Management
  - Finance
  - Marketing

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### 6.9 SUMMARY

- The term farm management comprises two words ‘farm’ and ‘management’. Farm basically includes every type of land on which some agricultural operations are performed by a person, either through his own labour or through the assistance of members of his household or hired employees.
- The production function that is fitted and utilized for further empirical analysis needs to be statically fit.
- The Cobb-Douglas production function is based on the empirical study of the American manufacturing industry undertaken by Paul H. Douglas and C.W. Cobb. It is a liner homogeneous production function of degree 1.
- Planning is fundamental to the management process, because it is the source, from which all other management activities emerge. It implies a thorough understanding of the goals of a particular farm. It requires intellectual effort, reflective thinking, foresight and imagination.
- The objective of profit maximization or cost minimization in farming can be achieved through different methods of farm business analysis. Budgeting and linear programming are two such methods, which enable a farmer to achieve his objective.
- Farm budgets are of two types: a partial budget and a complete budget. When a plan is drawn to estimate the returns from a part of the farm business, it is referred to as a partial farm budget.
- As in financial budgeting, farm budgeting also needs to be approached in a systematic manner. Each farmer prepares a budget that is the best in his own judgment. But as a matter of fact, there has to be an orderly approach that is objectively followed by any farmer, while preparing his budget.
- Choice variables are variables in terms of which the objective function of a linear programming problem is expressed. The linear programming technique

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aims at finding the values of these variables that would maximize or minimize (as the case may be) the given objective function.

- Linear programming has proved to be a highly useful tool of analysis for farm management. Theoretically, it is being widely used, but it has its limitations.
- The main characteristics of capitalistic farming are large size of the farm, use of sophisticated machinery and hired labour for cultivation. In this type of farming, if the farm is owned by an individual landlord, he or the manager appointed by him will be controlling its operations.
- A cooperative farm is a voluntary organization of individual land owners, for the purpose of joint cultivation of land. A member of a cooperative farm can withdraw his membership from it and can resume individual cultivation of his own land, if he chooses to do so.
- Cost production is an important factor in profit maximization and any rational farmer who aims to earn maximum profit considers the cost of production. In order to increase profits, a farmer usually contemplates cutting costs as a source to increase profits.
- The revenue of a farm along with its costs determines profits reaped by the farmer. After having some knowledge of cost concepts, it is necessary now to study the concept of revenue since the farmer's profit will be equal to the difference between its total revenue and total cost.
- On a farm, the main objective of the farmer is to use the scarce resources that leads to its maximization, on a continuing basis, according to the value of gross output or profits or farm business income or operational surplus, subject, of course, to certain utility consideration.
- Progressive agriculture, as it is pointed out, can serve as a powerful engine of growth. One important way through which agriculture promotes the development of the non-agricultural sector is by supplying its products- both food and fibre to the latter.
- The debate regarding the relationship between size of the farm and productivity has been taking place, both at the theoretical as well as the empirical plan.
- The capital intensive technology basically characterizes the Green Revolution in agriculture. It is known to have opened up many avenues to farmers for growth. Many empirical studies in the field of inverse relationship have been conducted with respect to farm size and productivity.
- The controversy regarding the inverse relationship between farm size and land productivity is not merely one of academic interest but of fundamental significance from the point of view of economic policy.

## 6.10 KEY WORDS

- **Oligopsony:** It is a market for a product or service which is dominated by a few large buyers.
- **Total cost of production:** It is the sum total of variable costs and fixed costs and includes both the explicit and implicit costs.
- **Total revenue:** It refers to the total amount of money that the farmer receives from the sale of his products, i.e., the gross revenue.
- **Net Operating Income:** It is calculated by deducting various operational expenses, incurred for production during the accounting period from the gross income as defined in gross income.

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## 6.11 SELF ASSESSMENT QUESTIONS AND EXERCISES

### Short-Answer Questions

1. Define the concept of farm management in your own words.
2. Write a short note on the Cobb-Douglas production function.
3. How is the Constant Elasticity of Substitution function different from the Cobb-Douglas production function?
4. What are the limitations of linear programming tool used for analysing farm management?
5. Write short notes on the following:  
(a) State Farming (b) Capitalistic Farming
6. What does the Cropping Intensity Index denote?
7. Briefly mention the aggregate measures of farm efficiency.

### Long-Answer Questions

1. Explain homogeneous production function.
2. Analyse the significance of farm planning.
3. Discuss the types of farm budgets.
4. Explain the seven cost concepts derived from the production that are used in economic analysis.
5. Examine the different views that farmers respond normally to price changes.
6. Critically analyse the relationship between prices and marketed surplus.
7. Discuss the controversy regarding the inverse relationship between farm size and land productivity.

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## 6.12 FURTHER READINGS

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### NOTES

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## UNIT 7 AGRICULTURAL PRICE POLICY

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#### Structure

- 7.0 Introduction
- 7.1 Objectives
- 7.2 Meaning and Objectives of Agricultural Price Policy
- 7.3 Aspects of Agriculture Price Policy
  - 7.3.1 Fixation of Product Prices Bases of Price Fixation for Agricultural Crops
  - 7.3.2 Price Policy for Agricultural Input
  - 7.3.3 Consumer's Protection and Agricultural Price Policy
  - 7.3.4 Ancillary Policies
- 7.4 Agricultural Price Policy of India (MSP)
- 7.5 Answers to Check Your Progress Questions
- 7.6 Summary
- 7.7 Key Words
- 7.8 Self Assessment Questions and Exercises
- 7.9 Further Readings

### 7.0 INTRODUCTION

Among all the national level policies of a nation, agricultural price policy holds an important place. It is a crucial instrument for ascertaining the prices of agricultural commodities in the country. This policy takes cognizance of various factors and contingencies associated with the agricultural field with the market and the economy, so as to protect the interests of the producers as well as the consumers. Without a robust agricultural price policy, there would be huge losses to a country's economy, directly affecting the farmer or the producer. The policy decisions also provide various provisions to avert any unfavorable situations like bad crop year, drought, and many such contingencies.

In this unit, you will learn about the nature of agricultural price policy and its objectives. Then you will learn about the main elements that form a part of the agricultural price policy and also assess the agricultural price policy of India.

### 7.1 OBJECTIVES

After going through this unit, you will be able to:

- Examine the meaning and objectives of the agricultural price policy
- Discuss the main elements of the agricultural price policy
- Critically analyse the agricultural price policy with reference to the MSP

## 7.2 MEANING AND OBJECTIVES OF AGRICULTURAL PRICE POLICY

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Prices of agricultural goods are a vital issue for the farmers, the households and the government. For the farmers, it is important because of low income elasticity of demand for the farm products and seasonal nature of farm production. For the households, it is important because farm products are, by and large, essential part of life. High prices of food products disturb household budget, and marginal families have to suffer most. For the government, it is important because a spurt in agricultural prices triggers inflation that threatens economic stability in the country. However, of all three entities, the farming community is most susceptible to changes in market price of their produces.

Owing to seasonal variations in production, prices of farm products are highly volatile implying that the income of the farmers keeps fluctuating. Volatility of production and income of the farmers impairs their inducement to invest. Low farm production may create foodgrain crises in the country. Stocks of foodgrain may dwindle to alarmingly low levels, prices may shoot up and real incomes of the poorer sections may shrink to the levels of absolute poverty, misery and starvation. It is imperative, therefore, that farm production is monitored and agricultural prices are stabilized.

Stability of agricultural prices would not only mean stability of income of the farmers; it would also mean accessibility to food supplies of larger sections of the society. Besides, it would mean an overall stability in the economy. Accordingly, a need arises for a suitable government policy to reduce price fluctuations and stabilize farm incomes.

### Nature of Agricultural Markets

The structure of agricultural markets in India conforms to the basic characteristics of perfect competition. The agricultural markets usually have small producers. In these kinds of markets, the produce is fairly homogeneous and buyers and sellers are well informed. Demand and supply of agricultural products does not respond quickly to the change in their prices.

In agricultural markets, even if price rises, farm's supply cannot rise instantaneously because of seasonal nature of production. Similarly, if price falls, consumer's demand does not rise owing to low elasticity of demand for the farm products. However, owing to seasonal nature of production and high dependence on climate, farm supplies are highly unpredictable, and so are their prices.

### Fluctuations in Agricultural Prices

Agricultural markets are characterized by the following:

- Inelastic demand
- Inelastic supply
- Unpredictable shifts in supply due to uncertainties of weather

Together, these characteristics deeply impact the prices of the agricultural output. A fluctuation in the supply of farm output causes price to fluctuate in the opposite direction. A bumper crop sends prices down; a poor crop ends them up. The degree of price fluctuation depends on the nature of demand. Price fluctuation will be high in case of inelastic demand and low in case of elastic demand. Since agricultural products are, by and large, inelastic in demand; price fluctuation (in response to supply fluctuation) is often very high.

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### Causes of fluctuation in agricultural prices

The main causes of fluctuations in prices of agricultural products are as follows:

- **Relatively inelastic demand:** The price elasticity of demand for agricultural products is less than unity or relatively inelastic. Less than unity price elasticity of demand means that despite a considerable fall in price, there is very little extension in demand, and despite a considerable rise in price there is very little contraction in demand. This is due to the fact that agricultural products are essential. These are basic necessities of life and have hardly any substitute. These are consumed more or less in fixed quantities.
- **Relatively inelastic supply or poor supply response:** The supply of agricultural products is relatively inelastic in comparison to that of non-farm products. Relatively inelastic supply means that despite considerable rise in price, there is very little extension in supply and considerable fall in price is accompanied by very little contraction in supply. It is owing to the following factors:
  - o Land is the principal factor input for agricultural products. The supply of agricultural land is almost fixed. Hence, there is very little possibility to increase the agricultural production by increasing the area of land under cultivation.
  - o Agricultural production is seasonal in nature. Any change in agricultural production must wait for the next season. You cannot shorten or lengthen the time period required for the natural processes of production. Also, you cannot cultivate the same land during a year, a number of times to raise the output of a particular crop. This is, unlike the supply of industrial output, which can be increased or decreased by using the same plant more or less intensively during a given period of time.
  - o In case of farming, supplementary costs (or fixed costs) of production are very high. This acts as a built-in-check on farm supply response.
- **Impact of climatic changes:** In less developed countries like India, agricultural output is widely exposed to uncertainties of the weather. While floods, frost or drought may ruin the crop, well-spread rainfall may produce a bumper crop. Uncertainties of production impart uncertainty to the price level.

## Consequences of fluctuations in agricultural prices

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Fluctuations in prices of agricultural products have serious consequences for farmers and buyers (whether they are consumers, industries or exporters). First (and foremost), a rise in price of agricultural products in general and foodgrains in particular raises the cost of living. This deprives poorer sections of the society of accessibility to foodgrains. Accordingly, the incidence of hunger and starvation tends to rise. Second, since farm products are used as industrial inputs, a rise in prices of farm products implies a rise in cost of industrial output. Obviously, this will hamper the growth process of industrial production. Third, when cost of living rises owing to uptrend of foodgrain prices, there is a pressure of inflation. Rising prices causes higher cost for higher wages and other factor remunerations, implying increase in factor prices. This is yet another built-incheck on the expansion of production process in the economy.

Rise in prices of agricultural produce raises income of the farmers. But the question is whether all farmers are benefitted in a situation of rising prices of agricultural produce. The answer is definitely no because a large number of small and marginal farmers seldom take their produce to the regulated markets. They often pledge their produce (at low price) to the money lenders to repay their accumulated debts. On the contrary, the poor farmers have to pay high prices for the purchase of inputs from the market (when prices of farm output rise, prices of farm inputs also rise). Even when the farmers tend to make some gains out of rising prices of farm output; these may be outweighed by the losses owing to rising prices of farm inputs. Thus, it is not always true that farmers are always the gainers, if prices of agricultural output tend to increase. However, it is not denied that large farmers and landlords build their fortune when prices tend to rise. This is because of a high holding capacity of these farmers. They build their produce away from glut in the markets; sell it when prices peak up and this makes a big kill in terms of profits.

From the buyer's point of view a fall in the prices of agricultural products is always welcome. But for the farmers, it is not less than a nightmare. Excessive fall in the prices of agricultural products creates disincentives in the mind of the farmers to produce more.

Consequently, production and supply of agricultural output tends to fall. As a result, the income level and purchasing power tends to shrink, which may trigger a fall in demand for the industrial and services sector of the economy. A general recession may set in if the slide in prices and demand continues unabated.

### Behaviour of Agricultural Prices in India

Behaviour of agricultural prices (since independence) reveals two important features:

1. Rising trends
2. Large fluctuations



Since 1950–1951, prices of agricultural commodities tended to rise almost continuously except for a few years in the first five year plan. Wholesale price index of agricultural commodities decreased from 110 in 1950–1951 to 88 in 1955–1956 and then increased to 123.8 in 1960–1961 with 1952–1953 as base year. With 1981–1982 as base year, price index of agricultural commodities increased from 107.3 in 1982–1983 to 271.2 in 1993–1994. Again with 1993–1994 as base year, price index of agricultural commodities increased continuously since then. It was 126.0 in 1995–1996, increased to 163.7 in 2000–2001, to 190.7 in 2005–2006 and to 204.1 in 2006–2007. Price index for agricultural products was 219.2 in 2007–2008, which further increased to 238.7 in 2008–2009 with 1993–1994 as base year. These figures reveal that, except during the First Five Year Plan, agricultural prices have tended to rise continuously. However, while the index of agricultural prices has been trending up, there have been marked fluctuations on the year to year basis.

### **Agricultural Stabilization Policy**

As already discussed, prices of agricultural products are unstable because of unplanned variation in supply of agricultural products. This enhances vulnerability of both the farmers and consumers. Rising prices adversely affects consumers and the industrial producers. They add to the cost of living of the households, and to the cost of production of the industrial producers. A situation like this contributes to shaking of overall demand in the economy and generating deflationary pressures. On the other hand, falling prices create disincentives for the farmers. Accordingly, the level of investment and production suffers a setback, and sense of insecurity and uncertainty grips the economy with regard to the availability of foodgrains.

Moreover, the government often intervenes in the market for agricultural commodities with a view to ensuring price stability. A suitable price policy plays a crucial role in stabilizing the following:

- Price structure of agricultural products
- Production level of agricultural products
- Consumption level of agricultural products

Following are the principal objectives of the agricultural stabilization policy:

- To stabilize prices of agricultural products so that farmers do not suffer the impact of low prices and households do not suffer the impact of high prices.
- To stabilize the prices of agricultural commodities so that the external trade of the country does not suffer through unfavourable terms of trade.
- To stabilize income of the farmers so that they are not trapped in the ‘paradox of plenty’.
- To stimulate the level of investment and output in agricultural sector. Here, it may be noted that any rational policy of stabilization would not seek to liquidate fluctuations of agricultural prices but only to regulate and moderate them.

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**Check Your Progress**

1. Why are the prices of agricultural goods a vital issue for the government?
2. What does perfect competition in agricultural market imply?
3. Name the elements of agricultural products which are stabilized with the help of a suitable price policy.

**7.3 ASPECTS OF AGRICULTURE PRICE POLICY**

There are several elements which form a part of the agricultural price policy. In this section, we will have a look at some of the main elements like fixation of product prices, price policy for agricultural inputs, consumer's protection and ancillary policies.

It is generally possible that the prices, favourable to the producers of agricultural products, may work against the interests of the non-agricultural sector and vice-versa. In fact, this has been one of the major considerations underlying the agricultural price policy in various countries during the course of the development of their economies.

Sometimes, the prices of agricultural products as well as the agricultural inputs have been so manipulated and the ancillary fiscal and administrative policies so devised that the benefits of all such policies were mainly or wholly passed on to the industrial sector.

On some other occasions, the price policy has favoured the agricultural sector at the cost of the non-agricultural sectors. The two types of price policies have been called 'negative' and 'positive' price policies respectively. We discuss below, these two price policies in some detail.

1. **'Negative' Price Policy:** For accelerating economic growth, a 'negative' agricultural price policy had been practised by a large number of countries in the early stages of their development. The main objective of such a policy was to keep the prices of food and raw materials relatively low (when compared with the prices of industrial products) so as to facilitate the growth of the industrial and tertiary sectors through increased profits and savings of these sectors. In other words, the terms of trade were purposively kept unfavourable for the agricultural sector. This was achieved mainly in two ways.

One method involves a compulsory sale or delivery of a portion of the agricultural output to the State at a very low price when compared with the open market price. There are also instances where a portion of the agricultural output was taxed away at zero-price. The result of these measures was that

the average price realized by the producer per unit of total output was lowered considerably.

The second method to achieve the same objective has been to let the prices of industrial goods, often purchased by the farmers, rise. The goods included both consumable such as textiles as well as farm inputs such as fertilizers, insecticides, pesticides and machinery. On the other hand, the prices of agricultural commodities were kept stable. This, once again, provided a relative advantage to the manufacturing sector. Any one or a combination of both these methods has been used in varying degrees by different countries like the United Kingdom, Soviet Russia and Argentina.

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- 2. 'Positive' Price Policy:** In contrast to the 'negative' policy, a number of developing countries today follow what may be termed as the 'positive' price policy which assures the farmer, a fair price for his produce. Such a policy is considered necessary because of the realization that unless the agricultural sector attains some critical minimum rate of growth, it would not be possible to attain the general targets of economic growth and development. This is true for a number of reasons, chief among which are:

- (i) In most of the developing countries, agriculture continues to be the single most important sector from the points of view of generating income, employment, savings and exports, and
- (ii) The increasing demand for food caused by increasing population and rising money incomes can be met only by a continuously growing agricultural production.

Experience has shown that a negative price policy obstructs the achievement of the desired minimum rate of growth of the agricultural sector. As a result of this experience, a number of countries which launched their development programmes with negative agricultural price policies have shifted to positive price policies during the last six decades or so.

In Soviet Russia, for example, the State has successively increased the purchase prices of agricultural commodities since 1951. Similarly, in a number of East European countries, compulsory deliveries to the State have been reduced and prices of agricultural commodities have been raised. Important among such countries are Bulgaria, Rumania and the erstwhile East Germany where significant price increase for agricultural products were affected in the early sixties. Similar steps have been taken by a number of other countries. At the same time, minimum prices of farm products have been guaranteed in a number of countries in Asia, Africa, Eastern Europe and Latin America. It appears that this trend in agricultural price policy has come to stay.

### 7.3.1 Fixation of Product Prices Bases of Price Fixation for Agricultural Crops

In the earlier section, we had pointed out that many Governments, in order to encourage the expansion of the industrial sector, followed a negative price policy

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for the agricultural commodities in the initial stages of industrial development. There was no specific criterion, laid down for fixing the prices of agricultural commodities under such a policy.

When the negative agricultural price policy yielded place to positive price policy, it became imperative to ensure that the agricultural prices were so fixed as would provide sufficient incentives to the farmers for achieving the maximum possible agricultural production. (These incentive prices are called minimum support prices. The government undertakes to purchase a particular crop in the market if its prevailing price falls below its minimum support price). As such, many principles for fixation of prices for agricultural commodities were evolved. At present, the prices are generally fixed on the basis of one or more of the following principles:

- (i) Cost of Production Principle;
- (ii) Ruling Prices Principle;
- (iii) Parity Prices Principle.

In fact, none of these principles, taken by itself, has been found to be completely satisfactory. As such, sometimes prices are fixed so as to satisfy more than one of these principles.

The following paragraphs explain the nature and merits and demerits of each one of these bases for price fixation.

**(i) Cost of production principle:** The average cost or the bulk line cost of production calculated with the help of cost accounting technique can be made a basis for determining the level of minimum support prices. Another variant of cost accounting method is the budgeting technique. In this approach, the cost of recommended farm inputs and their average yields are taken into account to estimate the cost per unit of output. The cost of production principle of fixing administered prices is desirable to the extent; it protects the primary producer against any loss due to an unexpected fall in prices.

There are, however, problems of assigning appropriate values to family labour, other inputs supplied from domestic sources and management input, in calculating the cost of production of one particular crop. Another important difficulty in determining the cost of production lies (according to Rath) in evaluating the services of land. Again, apportioning of joint costs over different crops creates another problem. Moreover, the concept of an average cost per unit of output (generally used as the basis for price fixation under this principle) is nebulous in view of the wide variations in agro-climatic conditions and farm practices. In other words, the variability of cost between different farms is very high. This, in turn, implies that this approach for fixing support prices for agricultural products may not cover the cost of production on every farm.

Further, a price policy, specially aimed at increasing production, cannot be based on average cost of production as has been, generally, the case. It is

an established fact that much of the increase in agricultural production in recent years has been due mainly to increase in the use of non-conventional inputs. As already explained, the rate at which the cultivators take up the use of such additional inputs is a function of financial returns. In such a situation, the cultivator should be indifferent to the conventional cost of production figures and be more concerned with marginal costs and marginal returns. He should increase the use of inputs to the point where the value of the marginal yield (discounted for risk) equals the marginal cost. The cost of production in a book-keeping sense is, thus not relevant to the problem. Moreover, the criterion of the cost of production considers only the supply side and totally ignores the influence of demand in the determination of prices.

Rath, in fact, is of the view that ‘the actual cost of production’ cannot be used as a criterion for fixing prices of agricultural crops because the price of a particular crop is announced before its sowing season while its actual cost of production can be computed only after it has been harvested. So, announced prices are based upon estimated cost of production and not upon the actual cost of production which may sometimes even become higher than the announced prices.

The cost of production principle is, therefore, not considered to be very sound for policy decisions.

- (ii) **Ruling Price Principle:** This principle requires that the price be linked to a moving average of market prices in the recent past. The advantage of this approach is that it builds the effect of demand trends into price fixation while the cost criterion ignores this aspect altogether. The importance of this criterion, therefore, lies in coordinating the demand growth with supply growth over the relevant time periods. However, in an economy where the prices might have been kept deliberately low in the past, the moving average may not properly reflect the market trends. Even otherwise, the prevailing prices, often fail to provide necessary incentives for an increase in production on long term basis.
- (iii) **Parity Prices Principle:** Parity price is the price that purchases, for the seller of a unit of an article, as much of the other commodities and services as he could purchase with the same unit in a given base period. In other words, for a given year, ‘parity’ signifies the same relationship of the administered farm prices, with the prices paid by the farmers for non-agricultural products, as it was in the base year. The parity prices principle may, thus be utilized to stabilize inter-relationship between the prices of agricultural and non-agricultural products. At the same time, this principle can also be used to ensure parity among prices for different agricultural products.

We have already pointed out that if the objective is to provide the primary producers with appropriate incentive to produce more and better, a ‘positive’

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price policy for agricultural products has to be followed. According to some, this implies that not only the parity between prices of agricultural and non-agricultural products be maintained but also that prices should continue to be made more favourable to the agricultural sector. In other words, the price policy should aim at changing the terms of trade in favour of agriculture. For achieving this objective, the following procedure is adopted.

In the first instance, price index number series for agricultural products and the industrial products are prepared with a suitable base year (or a base period).

Then the ratio between the index number of agricultural commodities and the industrial commodities respectively, for the base year is found. As the index number of prices of the two sets of commodities in the base year is equal to 100, the ratio between the price level of the sets of these commodities will always be equal to one. However, this ratio is generally assigned a value of 100. This is called the 'Parity Price Ratio'.

Thereafter, the government which wants to ensure a parity between the agricultural prices and the industrial prices for any year, finds the actual price ratio by using the price index numbers for the two sets of commodities for that year. On the assumption that the base year price ratio has been assigned a value equal to 100, this ratio can have a value less than 100, equal to 100 or more than 100.

Now for achieving the parity between the prices of agricultural commodities and the industrial commodities, as it existed in the base year, the government must ensure that the value of this ratio becomes equal to 100. For this purpose, it will increase or decrease the agricultural prices to the required level. The changed agricultural prices will be called the 'Parity Prices' for agricultural commodities for that particular year.

If the government wants that the terms of trade should be made more favourable to agriculture for any year, it can do the same by making such changes in the agricultural prices so as to bring the price ratio for that year to a desired level, which is more than 100. Price ratio, for a particular year may be conceived in a number of ways.

Some of these price ratios are:

- (i) Ratio between prices of all agricultural commodities and all non-agricultural commodities. This is calculated as

$$\frac{\text{Price index of all agricultural commodities}}{\text{Price index of all manufactured commodities}} \times 100$$

We know that the purchases of manufactured commodities made by the farmers consist of agricultural inputs as well as consumer goods. Price ratio calculated in this manner, therefore, does not distinguish between protection to be given to the farmer as a producer and as a consumer. This method is, however, useful when we want to know or adjust the movement of terms of

trade between the agricultural and the manufacturing sectors as users of each other's products.

- (ii) Ratio between prices received for the farm products and prices paid for farm inputs is calculated as:

$$\frac{\text{Price index of all agricultural commodities}}{\text{Price index of farm inputs}} \times 100$$

This concept of price ratio is useful when the objective is to protect the interests of the farmer as a producer. A rising price ratio will indicate favourable movement of the terms of trade for the producers in the farming sector.

In case, in a given year, this ratio is less than 100, it will mean that the agricultural prices are lower than the prices of the farm inputs in that year when compared with the base year. Prices of agricultural crops, can then be so fixed as to bring this ratio to 100 or even higher.

- (iii) Ratio between prices of individual agricultural commodities and all agricultural prices. The price ratio for the current year is calculated as:

$$\frac{\text{Price index of the individual agricultural commodities}}{\text{Price index of all agricultural commodities}} \times 100$$

This concept of price ratio is useful for bringing about adjustment in crop mix for the purpose of achieving planned targets of production in respect of certain crops. Price ratios should be made favourable for those crops whose production is required to be boosted.

Parity approach, obviously delinks the administered prices from the cost of production. Sometimes, this can create disincentives for the producers. Further, parity price criterion may imply fixation of different prices for the same crop in different regions of the same country because of differences in the price structure of the industrial sector in those regions, due to various reasons. Administratively, this may not be an easy job. Further, many problems are faced in the construction of index numbers used for knowing the current price ratios.

As pointed out earlier, none of the above criteria is free from drawbacks. As such, the price fixing authorities do not base their decisions totally on one criterion. They rather consider not only the guidelines suggested by the foregoing approaches but also many other factors while fixing the prices.

### 7.3.2 Price Policy for Agricultural Input

A variety of inputs are used by the farmers for growing crops. These agricultural inputs include labour from humans, farm animals, machines; fertilizers including manure, pesticides and chemical fertilizers, seeds, electricity and irrigation. All of the costs for these inputs contribute to determining the final cost of agricultural output. This is why the pricing policy for agricultural input is so important.

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The use of modern equipment and fertilizers can be traced to the Green Revolution, when the new agricultural policy was adopted, which introduced the new high yield variety seeds, irrigation facilities, and heavy use of fertilizers. Since most of fertilizers and modern inputs were imported and costly, it laid a financial burden on the farmers.

This is why the government started introducing the input subsidies so that the farmers can make use of the lower costs of inputs and also transfer the benefits of their savings from these lowered costs to the consumers, keeping the overall food prices stabilized and food inflation under control. Another objective of the input subsidies is to maintain high productivity.

Subsidies are now being provided by the government in the field of fertilizers, seeds, irrigation and electricity. In some areas like fertilizers, the government directly pays the fertilizer producing companies, whereas in other areas like electricity and irrigation, the subsidy is provided in the form of lowered costs to the farmers.

There are many policies introduced by the government for the setting the prices of these agricultural inputs. These include setting up of National Seeds Corporation, Nutrient Based Subsidy, setting up of corporations like IFFCO, separation of electricity feeders with the help of schemes like Pandit Deen Dayal Upadhyay Gram Jyoti Yojana, and canal linkages etc. Subsidies now form a large share of the government expenditure with up 40 to 70 per cent subsidies in fertilizers and 75 to 90 per cent subsidies in electricity and irrigation.

But more than making the farming operation productive and cost effective, the subsidy policies in India are now largely driven by political motives. To appease the vote bank or under political pressure from different groups, subsidies are now granted excessively, and the consequences can be very harmful.

Not only do such subsidies increase the financial burden of the government by taking the lion's share of the annual budgets but these are also increasing the trend of overutilization of inputs for production. This has adversely affected the environment through rapid soil degradation, depletion of groundwater resources, and imbalance in the nutrients of the soil. All of this, at the cost of little or no improvement in the agricultural production; for example, in the case of fertilizer subsidy in India. Additionally, it is also being said that the subsidy in agricultural inputs are not getting effectively reflected in the final market cost of the agricultural outputs, even the farmers are unable to comprehend the market signals leading to indiscriminate and skewed use of resources.

Price policy for agricultural inputs should take into consideration the target base, specific regulations and restrictions based on its use, rationing, distribution and duration. Only then, will the subsidy be efficient and helpful to the economy.

### 7.3.3 Consumer's Protection and Agricultural Price Policy

This aspect of price policy is particularly complicated as it necessarily involves balancing of conflicting interests of millions of poor consumers, on the one hand,



and of the farmers, on the other. The issue can also be looked as one of reconciling the interests of the village and the city.

While we have discussed the significance of raising the prices of agricultural output as an inducement to agricultural growth, we should also recognize that agriculture produces consumer goods whose purchases cover the bulk of the expenditure of low income people. If prices of food articles are allowed to increase, the low income people are hit hard. Moreover, a rise in the cost of living, due to higher food prices, generates a demand for higher wages which, in turn, adversely affect industrial profits and capital formation in the industrial sector. This implies that a policy of providing price incentives to the farm producers must be accompanied by a policy of restricting increases in food prices, especially for the urban consumer. The choice of the mechanism to attain this objective will depend upon the actual situation.

In a situation of extreme scarcity, urban rationing may be the only way to keep prices under check. In less extreme situations, however, a 'stock and release' policy is likely to serve the purpose. Under this policy, the government imports grains and/or purchases grains from the farmers at home. The purchases borne, may be made at or above the minimum guaranteed prices. The public stocks so acquired are released for distribution in the urban areas and the maximum retail price is fixed by the government.

The sale price fixed by the government may be lower than the cost of making the grains available to the urban distribution centres. These prices may also be lower than the open market prices. For this reason, the retail price fixed by the government is usually termed as 'fair' price. This type of price relief may be given either to all classes of urban consumers or only to the low income consumers.

No hard and fast rules can be laid down for the determination of the 'fair price'. It is essentially a welfare price and should reflect the value judgement of the policy makers. The policy makers must, however, operate within the constraints of (i) availability of stocks and (ii) the capacity of the exchequer to finance the subsidy.

#### 7.3.4 Ancillary Policies

It is important to note that for achieving the objectives of the agricultural price policy, some additional measures need to be adopted. And, in this context, the following ancillary policies are particularly relevant:

Firstly, it is important that sufficient resources, in terms of men and materials, be allocated to domestic research effort so as to generate new crop varieties and introduce new agricultural practices and farm implements which form the basis for yield increasing, cost-reducing technological changes in agriculture. A successful programme of research is extremely necessary, if the incentives provided by remunerative prices have to ultimately result in a significant increase in agricultural production.

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Secondly, introduction of technological change leads to an increase in the demand for inputs such as high yielding variety seeds, credit, fertilizers and water. These inputs must be made readily available to the farmers. This implies that timely steps to produce certain crucial inputs at home or to import the same, must be taken. Setting up of an effective organization for the distribution of these inputs is equally important. Failures on the input supply front can scuttle the efforts to increase agricultural production in spite of high prices. An efficient extension service organization is also needed for ensuring the optimum use of new inputs.

Thirdly, steps must be taken to ensure a smooth functioning of the system of agricultural marketing. In case, the marketing system is inefficient due to any reason, there will be large differences between the prices which the Government assures and what the farmers ultimately get. (The latter will be much lower due to high cost of marketing of the agricultural crops). Under such a situation, the price policy, will obviously fail to send the right signals to the farmers.

Falcon specifically suggests provision of proper storage facilities, as another important measure to make the price policy fully effective.

No doubt, the aforementioned measures suggested are basically meant to help in the introduction of a technological change for the development of the agricultural sector or for improving the marketing of agricultural produce. These are, however, at the same time, equally relevant for the effective implementation of the price policy.

**Check Your Progress**

4. Name the principles on which prices are fixed in the agricultural sector.
5. In the parity prices principle, what does parity signify?
6. What are the constraints considered for determining the 'fair prices' of agricultural products?
7. What will happen if the market system is inefficient?

## **7.4 AGRICULTURAL PRICE POLICY OF INDIA (MSP)**

With a view to achieve the agricultural price policy objectives, the government of India announced price policies every year through the Commission for Agricultural Costs and Prices (CACP). This commission was set up in 1965 as agricultural prices commission got renewed as CACP in 1985 in India. Price stabilization policy of the government included the following:

- Determination of minimum support prices, issue prices and procurement prices
- Buffer stock operations

A brief description of these components of price is as follows:

- **Minimum support price (MSP), issue price and procurement price:**

Commission for Agricultural Costs and Prices (CACP) in every season declares minimum support price, issue price and procurement price for various agricultural products. **Minimum support price** is the guaranteed minimum price a farmer will get by selling his product. If market price falls below this price, the government buys the surplus from the farmers at the declared minimum price. Issue price is the price at which government sells agricultural products and other consumer goods to the consumer through fair price shops. Procurement price is the price at which government purchases agricultural products from the farmers to maintain its stocks for Public Distribution System (PDS). **Procurement prices** are generally more than the minimum support price declared by the government because unless the procurement price is higher than the MSP, farmers would not sell their products to the government, they would then prefer to sell in open market where prices are generally higher than MSP.

Minimum Support Prices (MSPs) for Rabi Marketing Season (RMS) 2020-21 in case of Wheat is ₹ 1925, and in case of Barley is ₹ 1525. Minimum Support Prices (MSPs) for Kharif crops of 2019-20 season has been ₹1815 for common grade Paddy, ₹ 2550 for hybrid Jowar.

- **Buffer stocks:** Buffer stock operations refer to purchase of agricultural goods through farmers, domestic markets or imports to build up or to maintain stocks. The basic aim is to moderate price fluctuations in the economy when production shows wide variations. The government adds to stocks during periods of surplus production and releases stocks, in the market during periods of deficient production.

While buying to build stocks, the government adds to market demand and combats its deficiency. While releasing stocks, the government adds to market supply and combats its deficiency. Thus, buffer stock operation tends to maintain the balance between demand and supply in the market for agricultural products.

Building up buffer-stocks of agricultural products is an important component of government price policy. Food Corporation of India (FCI) is the agency that conducts buffer stock operations and state trading. FCI purchases foodgrains from the farmers and markets, and sells them (at the subsidized price) through fair price shops to the specified sections of the society.

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**Table 7.1** Food grains Production, Procurement, Offtake and Stocks  
(in million tonnes)

Year	Production of foodgrains minus pulses	Foodgrain Procurement	Procurement as percentage of production	Offtake (TPDS/ NFSA + Welfare schemes)	Stocks as of 1st July
2015-16	235.22	64.91	27.6	53.73	54.72
2016-17	251.98	61.14	24.3	56.58	49.85
2017-18	259.60	69.10	26.6	57.85	53.48
2018-19	261.55*	80.40	30.7	56.40	65.14
2019-20	132.35**	60.06@	45.38@	42.82#	74.40

Source: Directorate of Economics &amp; Statistics, Ministry of Agriculture and Farmers Welfare. Foodgrain bulletin, DFPD.

\*As per 4<sup>th</sup> Advance estimates. \*\* As per 1<sup>st</sup> Advance estimates Kharif only.@ as on 31<sup>st</sup> December, 2019. # offtake upto December, 2019**NOTES**

- **Organization of food zones:** To introduce an element of stability in agricultural prices, food zones were organized in March 1964. The country was divided into eight wheat zones. Rice zones were formed in South India. On the failure of this experiment, each state was made a separate zone. Movement of foodgrains within a zone was free but restrictions were imposed on movements from one zone to the other. The government took upon itself the task of procuring foodgrains from the surplus states and distributing them to the deficit states through the public distribution system.
- **Ration and sale through fair price shops:** The PDS in our country operates through a network of ration shops and fair price shops. Fair price shops are intended to meet the minimum needs of the vulnerable sections of the society. However, these shops are, at present, meeting the requirements of all and sundry. For their extra need of foodgrains, if any, the consumers can turn to the free market. The total number of fair prices shops has increased from 2.39 lakh in March 1979 to more than 5.37 lakhs in 2020. Despite this apparently massive coverage, the PDS is in fact unable to meet the total requirements of foodgrains of all vulnerable sections of the society.
- **Other steps:** In addition to the measures discussed above, the government initiated a number of other steps to ensure favourable returns to the farmers and reasonable prices to the consumers. These included building up of buffer stocks, state trading, nationalization of wholesale trade in wheat and rice, procurement from wholesalers, import of foodgrains, etc.

**Evaluation of the agricultural price policy**

The basic objective of the agricultural price policy is to assure the farmers a reasonable return and install an element of certainty and confidence in them. The agricultural price policy in India has succeeded in achieving this objective to a certain extent. But there have been some shortcomings.

- **Distortions in cropping pattern:** A point in the 'Report on Currency and Finance', 2001–2002, hints that the agricultural price policy of the

government has led to distortions in the cropping pattern, this is due to the reason that while the MSP of rice and wheat (particularly of wheat) has generally been higher but the cost of production of coarse cereals and pulses has been less than the cost of production. This has made the cultivation of rice and wheat more attractive than pulses and coarse cereals leading to a diversion of area towards them.

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- **Faulty criterion being used for calculating MSP:** CACP uses cost of production as the main criterion to decide the level of MSPs. As correctly pointed out by Ramesh Chand, Director of IABM, this is justified when there is a situation of scarcity and augmenting supply is the primary objective. However, when there are signs of emerging surplus, then demand side factors should get primacy in determining the MSP. However, this principle is not being followed in the case of rice and wheat, even though their stocks are accumulating and causing a severe burden on fiscal resources.
- **Adverse impact on investment:** Hike in procurement prices leads to an additional expenditure by the government. Given the overall resource constraints the additional expenditure comes at the cost of a decline in fixed investments. While this additional expenditure on stocks favours only rice and wheat; it is the procurement price of these two crops that has been raised considerably year after year. The decline in fixed investments adversely affects the demand for many non-agricultural GDP, which is not adequately compensated by an increase in agricultural GDP.
- **Bias in favour of surplus states:** The MSPs benefitted farmers in only a few states. Nearly all states in India grow rice, and approximately twenty states grow wheat. However, FCI procures approximately 95 per cent of wheat from three states—Punjab, Haryana and Western U.P. and approximately 95 to 90 per cent of rice is procured from five states—Punjab, Andhra Pradesh, Haryana, U.P. and Tamil Nadu.
- **Contribution to inflationary trend:** CACP has been recommending a hike in procurement prices year after year. In fact, an increase in procurement and minimum support prices (MSP) has become more or less a ritual performed twice a year. In recent years, the large farmers' lobby has become very powerful in political decision-making processes and has been able to force increases in procurement prices much higher than those recommended by CACP.
- **Bias in favour of large farmers:** Increases in MPS and procurement prices over the years have acted as an incentive to producers to increase their output. However, most of the benefits have been cornered by the large farmers who were able to implement the new agricultural strategy and obtain credit and other inputs easily. It has been estimated that whether for wheat or rice; in each state the average income transformer to large farmers is approximately ten or more times greater than those received marginal farmers.

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- **Flaws in PDS:** The main drawbacks of this system are as follows:
  - o It is restricted mainly to wheat and rice only while inferior grains, which are the main food of poor people, have been generally ignored.
  - o For a considerable period of planning, the PDS remained limited mostly to urban areas.
  - o PDS supplies are inadequate in regions with a higher proportion of population below the poverty line.
  - o PDS has so far been expensive because no efforts were made for targeting.
- **Impact on rural poor:** As a consequence of increases in foodgrain prices (flowing from increases in procurement prices) hardships of landless labourers and small farmers, who constitute a major portion of rural population have increased considerably. Benefits of high prices hardly accrue to these sections because they do not supply much marketed surplus and depend mostly on the market for meeting their consumption requirement.
- **Price incentives and fiscal square:** According to J. Mohan Rao and Servaas Storm, when agricultural prices rise as a consequence of price incentive, public investment relevant to potential output in agriculture actually declines because of a consequent fiscal squeeze.

In conclusion, it needs to be pointed out that announcing procurement prices has become one of the primary tools of intervention in agriculture while other crucial issues like fall in capital formation in agriculture, developing irrigation facilities, need for changing land holding patterns etc. have been ignored.

MSP has been a hot topic of debate again in 2020 with the introduction of the three farm bills. Critics and farmers are of the belief that the freedom of marketplace may prove to be problematic for farmers in the APMC mandis as they feel dealing in the private marketplace would not even allow them the measly MSP they are given today due to fierce competition and exploitative practices of the private industry.

### Instruments of Agricultural Stabilization Policy

The principal instruments of stabilization programme may broadly be classified into the following categories:

- **Price support:** Price support is a programme under which the government guarantees a certain minimum prices to farmers. It may take any of the following forms:
  - o **Parity prices:** It refers to fair prices received by farmers for what they sell relative to the prices they pay for non-farm products. The government passes legislation to fix parity prices.

- o **Storage and loan programme:** Under this programme, the government advances loans to farmers at the harvest time. The loan amount is the multiple of support price quantity in storage.
- o **Government's purchases and sales at a minimum price:** Under this method, the government fixes a certain minimum price for an agricultural product. The government buys whatever amount the farmer wishes to sell at the minimum price. Purchases of the government are kept as a buffer stock. The government releases the stocks to meet deficiency of market supplies and to combat any spurt in market price.
- **Supply management:** Supply management refers to any government programme whose goal is to limit farm output. The government generally employs various methods to reduce supplies of price supported products. The common methods are as follows:
  - o By restricting the area on which a particular crop is to be planted
  - o By fixing marketing quotas and specifying the amounts that an individual farmer can market at support prices
- **Target price:** Target price is a price that is guaranteed to farmers by the government. When the market price falls below the target price the government pays the farmers the difference. The difference paid by the government is also called subsidy. This method gives consumers a better deal.

## NOTES

### Check Your Progress

8. Under which condition would farmers choose sell their products to the government over open market?
9. According to Ramesh Chand, director of IABM, when is the use of cost of production as the main criterion for determining the level of MSP justified?
10. Name the three forms of price support.

## 7.5 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Prices of agricultural goods are a vital issue for the government because a spurt in agricultural prices triggers inflation that threatens economic stability in the country.
2. Perfect competition in agricultural markets usually has small producers. In these kinds of markets, the produce is fairly homogeneous and buyers and sellers are well informed. Demand and supply of agricultural product does not respond quickly to the change in their prices.

## NOTES

3. A suitable price policy plays a crucial role in stabilizing the following:
  - Price structure of agricultural products
  - Production level of agricultural products
  - Consumption level of agricultural products
4. The prices are generally fixed in the agricultural sector on the basis of one or more of the following principles:
  - (i) Cost of Production Principle
  - (ii) Ruling Prices Principle
  - (iii) Parity Prices Principle
5. In the parity prices principle, 'parity' signifies the same relationship of the administered farm prices, with the prices paid by the farmers for non-agricultural products, as it was in the base year.
6. Availability of stocks and the capacity of the exchequer to finance the subsidy are the constraints considered for determining the 'fair prices' of the agricultural products.
7. In case, the marketing system is inefficient due to any reason, there will be large differences between the prices which the Government assures and what the farmers ultimately get. (The latter will be much lower due to high cost of marketing of the agricultural crops).
8. Only under the condition that the procurement prices are more than the minimum support price declared by the government, would the farmers sell their products to the government.
9. As per Ramesh Chand, Director of IABM, the use of cost of production as the main criterion for determining the level of MSP is justified when there is a situation of scarcity and augmenting supply is the primary objective.
10. The three forms of price support are parity prices; Storage and loan programme; and government's purchases and sales at a minimum price.

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## 7.6 SUMMARY

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- Seasonal variations in production, low farm production, stocks of foodgrains are all important issues which make agricultural price policy important for farmers, households and the government.
- Inelastic demand, inelastic supply and unpredictable shifts in supply deeply impact the prices of the agricultural output.
- Fluctuations in agricultural prices effects cost of living, cost of industrial output, factor prices and food inflation.
- A suitable price policy plays a crucial role in stabilizing the price structure of agricultural products, production level of agricultural products, and the consumption level of agricultural products.



- The main objective of a negative policy is to keep the prices of food and raw materials relatively low (when compared with the prices of industrial products) so as to facilitate the growth of the industrial and tertiary sectors through increased profits and savings of these sectors.
- A positive price policy is considered necessary because of the realization that unless the agricultural sector attains some critical minimum rate of growth, it would not be possible to attain the general targets of economic growth and development.
- At present, the prices are generally fixed on the basis of cost of production principle (the cost of recommended farm inputs and their average yields are taken into account to estimate the cost per unit of output) ; ruling prices principle (This principle requires that the price be linked to a moving average of market prices in the recent past); and parity prices principle (is the price that purchases, for the seller of a unit of an article, as much of the other commodities and services as he could purchase with the same unit in a given base period.)
- All of the costs for agricultural inputs contribute to the final cost of agricultural output. The Government started introducing input subsidies so that the farmers can make use of the lower costs of inputs and also transfer the benefits of their savings from these lowered costs to the consumers, keeping the overall food prices stabilized and food inflation under control.
- A policy of providing price incentives to the farm producers must be accompanied by a policy of restricting increases in food prices, especially for the urban consumer, so that balance between the benefits of the farmers and consumers is maintained.
- Ancillary policies include investment in domestic research; smooth functioning of agricultural market, and easy access to new technology.
- Price stabilization policy of the government includes determination of minimum support prices, issue prices and procurement prices, buffer stock operations, organization of food zones, rationing etc.
- Distortions in cropping pattern, faulty criterion being used for calculating MSP, adverse impact on investment, bias in favour of surplus states, contribution to inflationary trend, bias in favour of large farmers, flaws in PDS are some of the shortcomings of the agricultural price policy in our country.

## NOTES

### 7.7 KEY WORDS

- **Procurement Price:** It is the price at which government purchases agricultural products from the farmers to maintain its stocks for Public Distribution System (PDS).

## NOTES

- **Buffer Stocks operations:** It refers to purchase of agricultural goods through farmers, domestic markets or imports to build up or to maintain stocks.
- **Target price:** It is a price that is guaranteed to farmers by the government. When the market price falls below the target price the government pays the farmers the difference.

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## 7.8 SELF ASSESSMENT QUESTIONS AND EXERCISES

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### Short-Answer Questions

1. What are the principle objectives of the agricultural stabilization policy?
2. Briefly mention the price policy of agricultural inputs.
3. Why is consumer's protection an important element of the agricultural price policy?

### Long-Answer Questions

1. Explain the principles of base fixation of agricultural products.
2. Discuss the shortcomings of the agricultural price policy of India up till now.
3. What are the impacts of a change in terms of trade in favour of the agricultural sector?
4. Describe the components of the price stabilization policy of our country.

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## 7.9 FURTHER READINGS

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## UNIT 8 AGRICULTURAL TAXATION: SCOPE AND IMPORTANCE

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*Agricultural Taxation:  
Scope and Importance*

### NOTES

#### Structure

- 8.0 Introduction
- 8.1 Objectives
- 8.2 Scope and Importance of Taxation in Agriculture in India
  - 8.2.1 Meaning of Agriculture Income
  - 8.2.2 Taxation of Agriculture Income
- 8.3 Answers to Check Your Progress Questions
- 8.4 Summary
- 8.5 Key Words
- 8.6 Self Assessment Questions and Exercises
- 8.7 Further Readings

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### 8.0 INTRODUCTION

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Agricultural income earned by a taxpayer in India is exempt under Section 10(1) of the Income Tax Act, 1961. As India is an agrarian economy, several incentives are offered to those who earning their livelihood from agriculture. In this unit, you will get to study about the scope and importance of agriculture in India.

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### 8.1 OBJECTIVES

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After going through this unit, you will be able to:

- State the meaning of agricultural income
- Examine the taxation of agricultural income
- Analyse the importance of agricultural income

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### 8.2 SCOPE AND IMPORTANCE OF TAXATION IN AGRICULTURE IN INDIA

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Agriculture is the primary occupation of the majority of population of India. This is the only source of income for majority of households in the country. People are dependent on agriculture for food and their basic requirements of everyday necessity. Moreover the government has been coming up with different schemes to encourage and promote growth in the agriculture sector. A major initiative in the promotion of agriculture includes tax exemption in this sector.

## NOTES

In order to understand the concept of income tax in the agricultural sector, the concept can be divided into two parts:

- i. Meaning of Agriculture income
- ii. Taxation of Agriculture Income

### 8.2.1 Meaning of Agriculture Income

Section 2 (1A) of the Income Tax Act, 1961 defines the agriculture income under three heads:

#### **I. Rent and Revenue derived from agriculture land situated in India:**

The assessee is not liable to pay tax on the rent or revenue derived from such agriculture land subject to the condition:

- a. The land should either be assessed to land revenue in India or be subject to a local rate assessed and collected by officers of the Government.
- b. In instances where such land revenue is not assessed or not subject to local rate, the land should not be situated within the jurisdiction of a municipality (whether known as a municipality, municipal corporation, notified area committee, town area committee, town committee or by any other name) or a cantonment board, and which has a population of more than ten thousand (according to the last preceding census which has been published before the first day of the previous year in which the sale of land takes place); or it should not be situated:

The aerial distance from municipality\* The population as per last preceding census.

Within 2 kms 10,000 to 1,00,000

Within 6 kms 1,00,000 to 10,00,000

Within 8 km > ₹ 10,00,000

- c. The revenue must not include any income arising out of the transfer of such land.

Any income derived from such land by agricultural operations including processing of agricultural produce raised or received as rent in kind or any process ordinarily employed by cultivator or receiver of rent-in-kind to render it fit for the market, or sale of such products.

Further, a direct nexus between the agricultural land and the receipt of income by way of rent or revenue is essential. (For instance, a landlord could receive revenue from a tenant.)

- II.** Any income derived from such land by agricultural operations including processing of agricultural produce raised or received as rent in kind or any process ordinarily employed by cultivator or receiver of rent-in-kind to render it fit for the market, or sale of such produce.

## NOTES

**III. Any income derived from any building owned and occupied by the assessee, receiving rent or revenue from the land, by carrying out agricultural operations:** The building must be on or near the land. It must be used by the assessee as a dwelling house or store-house or an out-building, in connection with the land.

In addition to the above, income derived from saplings or seedlings grown in a nursery is also considered as agricultural income.

To consider an income as agricultural income, certain points have to be kept in mind:

- i. Usage of land for agricultural operations:** Agricultural operations means efforts induced for the crop to be grown on the land. The ambit of agricultural income covers income from agricultural operations, which includes processes undertaken to make the product fit for sale in the market. Both, rent or revenue from the agricultural land and income earned by the cultivator or receiver by way of sale of products are exempt from tax only if agricultural operations are performed on the land.
- ii. Cultivation of Land is a must:** Some measure of cultivation is necessary for land to have been used for agricultural purposes. The ambit of agriculture covers all land produce like grain, fruits, tea, coffee, spices, commercial crops, plantations, groves, and grasslands. However, the breeding of livestock, aquaculture, dairy farming, and poultry farming on agricultural land cannot be construed as agricultural operations.
- iii. Ownership of Land is not essential:** In the case of rent or revenue, the assessee must have an interest in the land (as an owner or a mortgagee) to be eligible for tax-free income. However, in the case of agricultural operations, the cultivator does not need to be the owner of the land. He could be a tenant or a sub-tenant. In other words, all tillers of land are agriculturists and enjoy exemption from tax. In certain cases, further processes may be necessary to make a commodity marketable out of agricultural produce. The sales proceeds in such cases are considered agricultural income because the producer's final objective is to sell his products.

### 8.2.2 Taxation of Agriculture Income

As discussed above, agricultural income is exempt from income tax. However, the Income-Tax Act has laid down a method to indirectly tax such income. This method or concept may be called as the partial integration of agricultural income with non-agricultural income. It aims at taxing the non-agricultural income at higher rates of tax.

This method is applicable when the following conditions are met:

- Individuals, HUFs, AOPs, BOIs and artificial juridical persons have to compulsorily calculate their taxable income using this method. Thus,

## NOTES

Company, firm/LLP, co-operative society and local authority are excluded from using this method.

- Net agricultural income is greater than ₹ 5,000 during the year; and
- Non-agricultural income is:
  - Greater than ₹ 2,50,000 for individuals below 60 years of age and all other applicable persons
  - Greater than ₹ 3,00,000 for individuals between 60 – 80 years of age
  - Greater than ₹ 5,00,000 for individuals above 80 years of age

In simple terms, the non-agricultural income should be greater than the maximum amount not chargeable to tax (as per the slab rates).

### The Debate on Taxing Agriculture Income

The agriculture income is exempted in India under Section 10(1) of the Income Tax Act. However, many people believe that agriculture income should be taxed because its revenue is a major contribution to society. Further, these people give the example of areas such as Maharashtra and Punjab where the main agricultural crop is sugarcane which is high yielding crop but there is no tax levied on such revenue. But the central government has not finalized any such amendment in income tax laws and even not willing to do so in near future.

#### Check Your Progress

1. Is agricultural income taxable in India?
2. What are the points to be kept in mind to consider an income as agricultural income?

## 8.3 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Agricultural income is exempt from income tax. However, the Income-Tax Act has laid down a method to indirectly tax such income. This method or concept may be called as the partial integration of agricultural income with non-agricultural income. It aims at taxing the non-agricultural income at higher rates of tax.
2. To consider an income as agricultural income, certain points have to be kept in mind:
  - i. Usage of land for agricultural operations
  - ii. Cultivation of Land is a must
  - iii. Ownership of Land is not essential

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## 8.4 SUMMARY

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- Agriculture is the primary occupation of the majority of population of India. This is the only source of income for majority of households in the country.
- Any income derived from such land by agricultural operations including processing of agricultural produce raised or received as rent in kind or any process ordinarily employed by cultivator or receiver of rent-in-kind to render it fit for the market, or sale of such produce.
- The ambit of agriculture covers all land produce like grain, fruits, tea, coffee, spices, commercial crops, plantations, groves, and grasslands. However, the breeding of livestock, aquaculture, dairy farming, and poultry farming on agricultural land cannot be construed as agricultural operations.
- Agricultural income is exempt from income tax. However, the Income-Tax Act has laid down a method to indirectly tax such income. This method or concept may be called as the partial integration of agricultural income with non-agricultural income. It aims at taxing the non-agricultural income at higher rates of tax.
- The agriculture income is exempted in India under Section 10(1) of the Income Tax Act. However, many people believe that agriculture income should be taxed because its revenue is a major contribution to society.

## NOTES

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## 8.5 KEY WORDS

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- **Municipal Corporation:** It is a legal term used for a local governing body. It consists of a group of people authorized by law to act as a legal personality and having its own powers, duties, and liabilities.
- **Aquaculture:** It refers to the farming of aquatic animals or plants, including breeding, raising and harvesting in all types of water environments in controlled conditions.
- **Limited Liability Partnership (LLP):** It is a form of business partnership between at least two business partners where some or all partners have limited personal liability for the financial obligations of the business.

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## 8.6 SELF ASSESSMENT QUESTIONS AND EXERCISES

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### Short-Answer Questions

1. How does the Income Tax Act define agricultural income in India?
2. Write a short note on the significance of agricultural income.

## NOTES

### Long-Answer Questions

1. Do you think agricultural income should be taxed in India? Give reasons for your answer.
2. Discuss the conditions under which partial integration of agricultural income with non-agricultural income is applicable.

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### 8.7 FURTHER READINGS

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## UNIT 9 NEW AGRICULTURAL STRATEGY AND GREEN REVOLUTION

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*New Agricultural Strategy  
and Green Revolution*

### NOTES

#### Structure

- 9.0 Introduction
- 9.1 Objectives
- 9.2 New Agricultural Scheme and Green Revolution
  - 9.2.1 New Agricultural Strategy
  - 9.2.2 Intensive Agricultural District Programme
  - 9.2.3 Intensive Agricultural Area Programme
  - 9.2.4 The Green Revolution in Indian Agriculture
- 9.3 Farm Mechanization
  - 9.3.1 Meaning of Mechanization in Agriculture
  - 9.3.2 Case for Mechanization of Agriculture
  - 9.3.3 Case Against Mechanization
  - 9.3.4 Conditions for Farm Mechanization in Developing Countries
  - 9.3.5 Problems Encountered in Farm Mechanization
  - 9.3.6 Important Categories of Mechanization
  - 9.3.7 Scope of Mechanization in India
- 9.4 Irrigation
  - 9.4.1 Need for Irrigation
  - 9.4.2 Vital Role of Irrigation
  - 9.4.3 Benefits of Irrigation
  - 9.4.4 Demerits of Irrigation
  - 9.4.5 Sources of Irrigation
- 9.5 High Yielding Variety of Crops
  - 9.5.1 Importance of HYV Seeds
  - 9.5.2 Some Improved Varieties
  - 9.5.3 National Seeds Corporation
  - 9.5.4 Progress of Area Under HYV
- 9.6 Answers to Check Your Progress Questions
- 9.7 Summary
- 9.8 Key Words
- 9.9 Self Assessment Questions and Exercises
- 9.10 Further Readings

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### 9.0 INTRODUCTION

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During the sixties, Indian agriculture experienced a spectacular increase in production, especially in that of wheat and rice crops. It was mainly through an increase in productivity per hectare of these crops. The jump in the rate of increase in productivity of these crops was so sudden and conspicuous that some economists termed the new change as 'Green Revolution.'

## NOTES

Agricultural development is a condition precedent for the over-all development of the economy. A progressive agriculture serves as a powerful engine of economic growth. It helps in initiating and sustaining the development of other sectors of the economy by providing the necessary capital, labour, raw material, wage goods and foreign exchange. In view of this, emphasis laid by the Government on the development of agriculture since the very beginning of the planning era in India was not at all surprising.

Against this background the new agricultural strategy which aimed at rapid and spectacular increase in foodgrain production was adopted from 1966-67. Although a new strategy in agricultural development in terms of I.A.D.P. and I.A.A.P. was already working in the country but the fundamental departure in the new strategy was the introduction of intensive cultivation using new high-yielding varieties of seeds backed by more and better plant nutrients, effective plant protection and adequate water supply. In the new agricultural strategy, a three-dimensional approach towards agricultural development was adopted which consisted of high-yielding variety programme, adoption of mechanization, modern chemical technology and foodgrains price support policy. The last section of this unit also throws light on the food processing industries in Indian Economy.

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### 9.1 OBJECTIVES

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After going through this unit, you will be able to:

- List the principal features of the New Agricultural Strategy
- Analyse the significance of High Yielding Variety Seeds (HYV Seeds)
- Explain the impact of Green Revolution on Indian agriculture
- Examine the meaning of mechanization in agriculture
- List the problems encountered in farm mechanization
- Identify the benefits of irrigation
- Examine the scope of food processing industries in India

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### 9.2 NEW AGRICULTURAL SCHEME AND GREEN REVOLUTION

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On the eve of independence, Indian agriculture was backward, stagnant and almost non-vibrant. The zamindars, as owners of the soil were more like absentee landlords who were interested in appropriating as much from the tillers of the soil as they could by way of land revenue. Productivity was low and the cultivators lacked any inducement to invest. Partition of the country had also caused severe damage as most of the fertile areas went to Pakistan. After independence, the

planners and the politicians realized the need for a major transformation in agriculture.

Accordingly, agriculture was accorded high priority in the Five Year Plans. In fact, the First Five Year Plan was almost exclusively an agricultural plan. However, during the initial years of planning, not much headway was made. Self-sufficiency in foodgrain production remained a far-fetched dream and we had to depend on imports to cope with our need for foodgrains. It was in 1960s that India could hit upon a technological breakthrough in agriculture, enabling us to formulate New Agricultural Strategy. The new strategy hinged upon the use of High Yielding Variety (HYV) seeds. It brought about a massive rise in foodgrain production, popularly known as the Green Revolution. Consequently, due to the Green Revolution, India emerged as a net exporter of food grains.

The present section attempts a comprehensive discussion of New Agricultural Strategy with a special focus on Green Revolution Indian agriculture.

### **9.2.1 New Agricultural Strategy**

On the recommendations of the Ford Foundation Team (visiting India in 1959), the government of India adopted a new approach for the development of agriculture, popularly known as the **New Agricultural Strategy**. Adoption of this Modern Agricultural Technology during 1960s to improve agricultural productivity came to be known as the New Agricultural Strategy or Green Revolution. It sought to increase agricultural production through higher levels of productivity. It involved the use of HYV seeds, chemical manures, supported with irrigation and plant protection measures; it also involved institutional changes in agriculture, besides improvement in the system of marketing.

The principal features of new agricultural strategy are the following:

- (i) **Input Package:** A package of improved inputs was the core component of the new agricultural strategy. It included HYV seeds, chemical fertilizers, insecticides and pesticides. New inputs were expected to cause a substantial rise in productivity.
- (ii) **Modern Know-how:** The modern methods of farming (or farm management techniques) came to be recognized as another important element of the new agricultural strategy. Modern know-how was to replace conventional wisdom which was based on crude approximations.
- (iii) **Institutional Reforms:** New policy laid stress on institutional reforms as well. It focused on the abolition of intermediaries, conferring ownership rights on tillers of the soil, improving size of holdings and fostering the concept of co-operative farming.
- (iv) **Multiple Cropping:** The new strategy stressed the need for multi-cropping in place of mono-cropping. It would enhance gross area under cultivation, even when net area remains the same.

## **NOTES**

## NOTES

(v) **Coordinated Programme:** Coordinated programme of agricultural development, in terms of community development projects, were to be launched. These programmes focused on all-round rural development through participation of all sections of the rural society.

(vi) **Agricultural Marketing:** The New Agricultural Policy related not only to the production but also to marketing. It stressed the point that the farmer must get a fair price of his produce. In this context, Agricultural Price Commission was to be set up.

In brief, the New Agricultural Policy drew a comprehensive roadmap of agricultural development. It focused as much on the removal of existing roadblocks in agricultural development as on the introduction of new techniques of production and new package of inputs. Also, agriculture was sought to be developed as an element of integrated rural development programme, which envisaged all round development of the rural areas at the village level or the district level.

### 9.2.2 Intensive Agricultural District Programme

On the basis of recommendations of Ford Foundation Team, in 1960-61, Intensive Agricultural District Programme was launched. Under this programme, development plans relating to agriculture were to be started in some select districts, rather than across all parts of the rural economy. The thrust of the programme was to accelerate the pace of growth through judicious use of inputs, manpower and financial resources in some select districts. However, it did not imply that the developmental efforts were to be put to rest in other parts of the rural economy, other than the select districts. The programme only implied that an intensive effort of development be made in certain select districts so that some exemplary breakthrough was achieved as a model of growth and development in rural areas. This is why this programme was called 'Intensive Agricultural District Programme'. The programme was also called 'Package Programme', because it involved a 'package' of improved methods of cultivation for achieving a break through in agricultural productivity and production.

#### Objectives of IADP

- (i) **Increase in Agricultural Productivity:** The main objective of this programme was to increase agricultural productivity through the application of modern techniques of cultivation.
- (ii) **Change in Attitude of the Farmers:** The programme focused on changing the attitude of the farmers in a manner that they feel inspired to adopt scientific methods of cultivation.
- (iii) **Development of Improved Farm Practices:** The programme stressed the need to develop improved practices of farming through research and analysis.

(iv) **Robust Administrative System:** The programme sought to develop a robust administrative system at the district level so that plans and programmes of growth were effectively enforced and efficiently monitored.

(v) **Increase in Farm Incomes:** The ultimate objective of this programme was to increase farm incomes so that farming was taken not merely as a source of subsistence, but a commercial venture.

## NOTES

### Criterion for Selecting District for IADP

Selection of districts for the IADP depended on the following parameters:

- (i) There should be irrigation facilities in the district.
- (ii) The district should not be highly vulnerable to natural calamities like floods, or droughts.
- (iii) Rural development institutions like, panchayats, co-operative societies, etc., should be sufficiently developed in the concerned district.
- (iv) The district should have adequate potential for growth and development.

Relying on these parameters, IADP was first started in seven districts and later extended to seventeen districts of different states as shown in Table 9.1.

**Table 9.1** Districts Under IADP

State	District	State	District
1. U.P.	Aligarh	10. Kerala	Palaghat
2. Punjab	Ludhiana	11. Maharashtra	Mandara
3. Haryana	Karnal	12. Assam	Cacher
4. Rajasthan	Pali	13. Karnataka	Mandya
5. Madhya Pradesh	Raipur	14. Orissa	Sambalpur
6. Bihar	Shahabad	15. Gujarat	Surat
7. Tamil Nadu.	Thanjavur	16. Bengal	Burdwan
8. Andhra Pradesh	Godavari	17. J & K	Six Blocks
9. Kerala	Alleppey		

In these seventeen districts, efforts were made to increase the agricultural production

In these seventeen districts, efforts were made to increase the agricultural production through judicious use of improved seeds, irrigation, chemical fertilizers, insecticides and pesticides, along with improved methods of cultivation.

### Achievement of the Programme

- (i) **Coverage:** Under the programme, scientific methods of cultivation were practiced on thirty-two lakh hectares of land across 29,286 villages of seventeen districts. The programme covered thirteen lakh peasant families.

## NOTES

**(ii) Package Programme:** In the selected districts, chemical fertilizers, pesticides and HYV seeds were judiciously used along with assured supplies of irrigation water.

**(iii) Farm Planning:** Under the programme, definite plans were drawn for about fifteen lakh farms. The objective of these plans was to educate the farmers with regards to the use and benefit of HYV seeds, chemical fertilizers and other components of the technology-package.

**(iv) Field Demonstration:** Knowledge of new technology was imparted to the farmers through model-farms. Demonstration through model farms aroused the farmers' interest in the new technology.

**(v) Increase in Productivity:** Prior to the programme, from 1950-51 to 1964-65, growth rate of agricultural productivity was 1.5 per cent per annum. After the programme was firmly rooted, growth rate of productivity (during the period 1964-65 to 1971-72), was recorded to be 2.4 per cent per annum. The New Agricultural Policy was most successful with respect to wheat crop.

Per hectare productivity of wheat shot up from 982 kg in 1964-65 to 2,707 kg in 2003-04. The selected districts of Punjab, Haryana and Western U.P. (where this programme was launched), witnessed 100 per cent increase in per hectare productivity. Besides, the share of the production of wheat which was just 16 per cent of the total foodgrain production in 1964-65 increased to 28 per cent in 1971-72. No significant improvement was recorded in the total and per hectare production of rice and coarse grains. In 1964-65, per hectare productivity of rice was 1,017 kg which increased to 1,145 kg in 1971-72. However, in some states where the supply of irrigation water was stable, per hectare productivity of rice recorded a 100 per cent rise.

**(vi) Change in Outlook of the Farmer:** As a result of the New Agricultural Policy, outlook of the farmers has undergone a significant change. In all the districts of IADP, not a solitary example of opposition to new technology was traced. It was in response to the new strategy of farming, that rich farmers started installing tube-wells for a stable supply of irrigation water in tandem with the application of HYV seeds and supplementary inputs. Even poor farmers were found to be ambitious to adopt the new technology.

### 9.2.3 Intensive Agricultural Area Programme

On the basis of the experience of Intensive Agricultural District Programme and midterm evaluation of the Third Plan, the government decided that in all those areas having potential of scientific agriculture, an intensive agricultural programme be launched. The Agricultural Production Board suggested that IAAP could be launched across 20 to 30 per cent of the area under cultivation. Following the recommendations of the Board, Intensive Agricultural Area Programme was

launched in 1964-65 across 117 districts of different states in the country. The programme focused on raising the farm productivity through intensive cultivation of some principal crops in the country.

*New Agricultural Strategy  
and Green Revolution*

### **Input package of the New Agricultural Strategy**

Input package of the new agricultural strategy included: (1) judicious use of manure, (2) High Yielding Variety Seeds, (3) high degree of plant protection, (4) mechanized means of farming, (5) stable irrigation, (6) soil improvement, and (7) improved techniques of farm management.

#### **(1) Judicious Use of Manures**

Judicious use of manures/fertilizers enhances fertility of land. Constant cultivation of the land causes erosion of its nutritive elements like nitrogen, phosphorus, potash, etc. These are replenished through fertilizers (or manures). Manures used in India are broadly divided as indigenous manures and chemical fertilizers. Here are some details:

- (a) Indigenous Manures:** Indian farmers have been making a use of indigenous manure like cow dung (*gobar*), compost, decomposed leaves, etc., since time immemorial. Many a time, the land is left fallow for regaining its nutritive elements.

Also, crop rotation is practised to conserve fertility of the soil more efficiently. However, these practices are no longer sufficient to revive, restore and raise fertility of the soil to the levels found in western countries. Chemical fertilizers must be used if substantial breakthrough in productivity is to be achieved.

- (b) Chemical Fertilizers:** These include urea, nitrogen, phosphate, and others. Use of chemical fertilizers is essential owing to the following reasons: (i) chemical fertilizers are found to cause a substantial rise in farm productivity. (ii) chemical fertilizers facilitate a shift from mono-cropping system to multi-cropping system, and enhances the gross area under cultivation, even when the net area is constant, (iii) use of chemical fertilizers is in sync with stable sources of crop-irrigation, and (iv) chemical fertilizers are complementary to the use of HYV seeds.

The government has taken several measures to encourage the use of chemical fertilizers. Restrictions on the sale of chemical fertilizers have been removed. Small and marginal farmers are given credit for the purchase of chemical fertilizers. Free consultation and training are offered to the farmers on proper use of chemical fertilizers. There has been a substantial rise in the number of retail outlets for chemical fertilizers. However, efforts are also underway to further explore the traditional sources of manures like *gobar*, compost and green manure. This is to ensure that there should not be undue pressure of demand for the chemical fertilizers, most of which are imported from rest of the world and,

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therefore, involve a heavy burden on the exchequer. However, traditional sources of manure are being explored not with a view to restricting the use of chemical fertilizers, but with a view to enhancing the overall supplies of manures/fertilizers across different regions of the country. In fact, the government is offering subsidy on the purchase of fertilizers by the farmers.

### **(2) High Yielding Variety Seeds (HYV Seeds)**

HYV seeds are an important component of the new technology. It is since 1964-65, that HYV seeds are being increasingly used in Indian agriculture. These seeds are produced by the state governments and registered seed producers. Good deal of research has been conducted by the Indian Council of Agricultural Research (ICAR) and different agricultural universities on evolving high yielding varieties of seeds. Certification of quality seeds is done by National Seeds Corporation. HYV seeds for wheat have proved to be most effective in combating food shortage in India. Similar seeds have been developed for rice, bajra, cotton and several other crops.

At the beginning of the Fourth Plan, the total area under HYV seeds increased was recorded to be 380 lakh hectares. State Seed Corporations were established during the Sixth Plan to promote the use of HYV seeds. These corporations cater to the demand for seeds at the state level. The corporations are engaged in special research programmes to develop HYV seeds for pulses, oilseeds, cotton, fodder and several other crops. Central government has encouraged the import of HYV seeds of coarse grains, pulses, oil seeds, vegetables and flowers. In 1970-71, the total area under HYV seeds was recorded to 150 lakh hectares. In 2000-01, it increased to 780 lakh hectares.

### **(3) Plant Protection**

In India, every year about 10 per cent of harvest is lost to insects and pests. Protection of crops from insects and pests is called plant protection. Plant protection measures include: seed treatment, spray of pesticides, destruction of rodents, etc. Thus, plant protection is undertaken before and after the seeds are sown. Prior to sowing, seeds are chemically treated to enhance their resistance to diseases. After sowing, crops are to be saved from pests and insects. In India, there are two main hurdles in implementing a plant protection programme:

First, the farmers lack technical efficiency in regard to the use of insecticides and pesticides. And second, market prices of insecticides and pesticides are so high that the farmers are often reluctant to buy them. With a view of keeping prices (of pesticides and insecticides) under check, the government has taken two notable steps: (i) raw materials (used for pesticides) have been exempted from excise duty and (ii) import of pesticides has been liberalized.

During the Fourth Plan, Pest Warning Scheme was launched to forewarn the farmers about plant diseases and pests. In the Fifth Plan, training facilities were



extended, official plant protection facilities were expanded, and an Agricultural Air Service was introduced for aerial spray of pesticides. In 1991, pesticides weighing eighty-two thousand tons were used. In the Seventh Plan, an Integrated Pest Control Strategy was adopted.

It aimed at adopting such plant protection measures which were environmental friendly. Also, new methods of plant protection were devised to minimize the side effects of pesticides. However, the use of only environmental friendly pesticides and only those which had the least side effects caused a reduction in their application. In 2000-2001, only 48,000 tons of pesticides were used, against 82,000 tons in 1991.

#### **(4) Soil Improvement**

In India, about 43 per cent of the total geographical area (or 14 crore hectares of land) is vulnerable to soil erosion. As a result, this land is rendered unfit for cultivation. However, about 4 crore hectares of this land can be reclaimed through soil improvement measures.

Accordingly, soil improvement holds promise to augment agricultural production. Soil improvement includes all such measures which are directed towards improvement of the soil. These measures include levelling of the soil, terracing, bunding, cultivating the soil along the contour lines, etc.

Following are some important measures (or programmes) adopted by the government as components of the new agricultural strategy.

- (i) Soil Conservation Programme:** Soil conservation programme was the key policy instrument to combat soil erosion. Soil erosion takes place when the top (fertile) layer of soil is either washed away by excessive rains or floods or blown away by strong winds. As a result, it becomes impossible to cultivate the land. Soil conservation programme sought to stave-off soil erosion through contour bunding; terracing, filling up of the drains, etc. In 1953, the Central Soil Conservation Board was established to implement the soil conservation programme. Initially, the progress of the programme was very slow because of the lack of any comprehensive National Soil Survey in the country. However, since 1960 soil surveys are being conducted as a matter of routine. Since then, soil conservation programme has become more effective. Assuming water-shed as an operational unit, soil (and water) conservation programmes were being implemented across 33.5 lakh hectares of land in 2000-01.
- (ii) Reclamation of Alkaline and Saline Land:** Alkaline and saline lands are also rendered unfit for cultivation. About 70 lakh hectares of land in Punjab, Haryana and U.P is affected by alkalinity and salinity. A central plan to reclaim this land was initiated in the Seventh Plan. A similar plan was launched in Gujarat, Rajasthan and Madhya Pradesh during the Eighth plan.

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An area of 6.5 lakh hectares of alkaline land was reclaimed by the end of 2000-01.

**(iii) Reclamation of Ravine Areas:** In many parts of the country, (particularly in Madhya Pradesh, U.P., and Rajasthan) there are rocky lands, called ravine areas. These areas serve as a refuge to the anti-social elements. It is not possible to bring it under cultivation unless it is cleared of these elements. The Central Government has drawn comprehensive plans for the reclamation of ravine areas.

**(iv) Control over Shifting Cultivation:** System of *Jhume* (shifting cultivation) is another evil associated with Indian agriculture. Under the Jhume system, cultivation is done at one place for some years and thereafter it is shifted to another place. The farmers clear a piece of land by burning the jungle.

They cultivate it for two or three years. When this piece of land is infested with weeds, they abandon it and clear another piece by burning the jungle. This system retards the process of agricultural growth by rendering land as culturable waste. Shifting cultivation prevails in the north eastern states like Assam, Meghalaya Nagaland, Tripura, Andhra Pradesh, etc. To curb and combat the practice of shifting cultivation, the government has launched Watershed Development Project. Under this project, jhume lands are developed on a watershed basis and transferred to jhumia families for permanent cultivation. By the year 2000-01, 80,000 hectares of land were estimated to be treated under the Watershed Development Project.

### (5) Irrigation

Of all the elements of input-package of new agricultural policy, irrigation is of central significance. Watering the land through wells, tanks, canals, etc. is called irrigation. Significance of irrigation is highlighted in terms of these observations: (i) Irrigation helps in increasing the net sown area in places where rainfall is scarce, (ii) as an anti-dote to the uncertainties of monsoon, irrigation helps stable supply of foodgrains (iii) irrigation facilitates multiple cropping, thus adding to the gross area even when the net area is constant, (iv) irrigation raises productivity, (v) crops like rice need constant supply of water, and irrigation is the only answer, (vi) irrigation facilitates the use of chemical fertilizers, HYV seeds and insecticides, are so very vital to crop production.

### (6) Mechanization of Agriculture

Mechanization implies the use of machines, like, tractor, harvester and thresher, (instead of man power or cattle power) in farming. Agriculture has been completely mechanized in western countries. In India, however, mechanization has remained a subject of debate. Opposition to mechanization is founded on the facts that in India (i) there is an abundance of manpower (as well as cattle power), (ii) that mechanization is likely to escalate unemployment which is already quite high, and

(iii) that the bulk of holdings are small and scattered where mechanization is ruled out as a viable proposition.

It is generally agreed that complete mechanization is neither possible nor desirable. Mechanization is being practised only in those areas where facilities of irrigation, manure, improved seeds and plant protection are available. According to the Planning Commission, too much of mechanization in agriculture is not in the interest of the country. Prof. A.K. Sen, in his book *Choice of Technique* has expressed the view that a country like India will have to distinguish between two types of capital equipment, while making a choice of technique in the agricultural sector: (i) those capital equipment which are labour saving like tractors, etc. (ii) those equipment which are land saving like manures. In his opinion, second type of capital equipment will prove to be more useful to Indian farming.

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### **(7) Scientific Methods of Farm Management**

Scientific methods of farm management play a significant role in raising farm productivity. Choice of crops, preparation of land, rotation of crops, selection of seeds, use of manure, use of irrigation water and the like factors need to be given a scientific consideration. These factors should not be determined through conventional wisdom based on the rule of thumb. Also, it must be realized that methods of cultivation are different for different areas such as, dry area, semi-dry area, irrigated area, unirrigated area, raised area, etc.

Agricultural research in India is directed to explore scientific methods of farming for different areas. Indian Council of Agricultural Research (ICAR) and various Agricultural Universities are actively engaged in the research work and their research results have made a substantial contribution in the area of scientific farming. Indeed, scientific methods of farming are becoming increasingly popular all over the country. The Eighth Five Year Plan aims at conducting special research for the following methods of cultivations: (i) multiple cropping in irrigated areas, (ii) rain-fed cultivation, (iii) mixed cropping, and (iv) dry farming.

#### **9.2.4 The Green Revolution in Indian Agriculture**

The term 'Green' in Green Revolution refers to 'crops' while 'Revolution' refers to 'spurt', together implying spurt in crop production. It started happening in India in 1967-68. In the year 1967-68 itself, food grain production increased by nearly 25 per cent. So much increase in foodgrain production in one year (in a country which earlier used to import foodgrains and now has become self-sufficient) implied a revolutionary change. Green Revolution not only revived Indian agriculture but also changed the very concept of farming in India. Conventional wisdom which was central in the decision-making process in Indian agriculture started fading into insignificance. Instead, modern technology, updated farm management practices, and market-oriented outlook emerged as the core parameters of crop farming in the rural Indian economy.

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New agricultural strategy facilitated a stupendous rise in agricultural output per unit of the inputs. A kilogram of high yielding variety seeds offered much more output than a kilogram of conventional seeds. Likewise, a kilogram of chemical fertilizers resulted in a substantially greater output than a kilogram of conventional manures. The shift in production possibility curve indicated a greater rise in the foodgrain production than the non-foodgrain production. This was because the new agricultural strategy had a greater focus on food crops rather than non-food crops.

### Check Your Progress

1. Which sector of the economy was given high priority in the First Five-Year Plan?
2. What was the main objective of the New Agricultural Strategy?
3. What was the thrust of the Intensive Agricultural District Programme?
4. What are some of the features of the Fifth Five-Year Plan?
5. What is the meaning of the term 'Green Revolution'?

## 9.3 FARM MECHANIZATION

Agricultural implements and machinery used for tilling of land and other field operations play a vital role in increasing the productivity and production of food, fodder and fibre in the country. Since time immemorial, the Indian farmer has been using traditional techniques of production. Even in this age of modernization, he continues to use hand-operated and animal drawn implements. The data from the All-India Livestock Census indicates that even today, there is a predominance of traditional implements particularly the wooden plough. As against the situation prevailing in India, the advanced countries of the world have adopted the most modern implements, viz tractors, threshers, harvest on combines, pump-sets, etc., which mainly require mechanical source of energy. The use of these advanced mechanical devices, no denying the fact, has increased agricultural production and productivity manifold. Influenced by the experience of the West in India, too, some big farmers in certain parts of the country have shown interest in introducing mechanization in agriculture. In whatever part of the country the mechanization of agriculture has been introduced, it is showing results. But India's adoption of mechanization on a large scale is hotly debated. India is a poor country of small and marginal farmers with abundant and relatively cheap labour. The critics of mechanization of Indian agriculture permanently oppose it on the ground that machinery being labour-saving, would displace large scale labour from the agricultural sector and render animal power useless. An economy already suffering from acute problem of unemployment cannot afford the introduction of any such agricultural mechanization which adds more to this problem.

### 9.3.1 Meaning of Mechanization in Agriculture

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Farm mechanization refers to the use of mechanical power in farm operations. It may be defined as the process of performing certain agricultural operations, which are usually done either by animals or men or by both, with the help of suitable machines. It not only includes the use of machines for tillage operations, harvesting and threshing of the farm produce but also includes power lifts for irrigation, trucks for transporting of farm produce, processing machinery, dairy appliances for cream separating, butter making, oil pressing, cotton ginning, rice handling etc. Mechanization, in brief, means the use of mechanical power along with machines that go with it. According to Dr. Bhattacharjee, mechanization of agriculture and farming process connotes application of machine power to work on land usually performed by bullocks, horses and other draught animals or by human labour.

Mechanization in agriculture may be of competing nature or of complementary nature to the human labour depending upon the circumstances under which it is resorted to. In a labour-scarce country, mechanization may be aimed at competing with human labour but in a relatively labour-abundant country like India, mechanization may be of a complementary nature.

Mechanization may also either be complete or partial. It is termed partial when only a part of the farm work is performed by machines. On the other hand, when farm operations are completely performed by machines, it is termed as complete mechanization.

In the Western countries, mainly due to the scarcity of labour, mechanization in agriculture has been more or less complete. But in countries like China, India, greater part of Asia, Africa and South America, mechanization of agricultural operations has been adopted on a limited scale. Limited adoption of mechanization in these countries is mainly due to the abundant supply of labour and animal power, on the one hand, and small and marginal holdings which are further sub-divided and fragmented, lack of fuel power and poverty of the masses, on the other.

Mechanization in Indian agriculture has to be viewed from two different perspectives. In the first instance, it has to be examined in the light of problems that might arise if agriculture is completely mechanized.

Problem such as displacement of labour and animal power has to be given a serious thought. Even if there were no such problems, (say), would it be feasible to adopt mechanization in the light of the poor economic position of a vast majority of our farmers. Would they be able to afford mechanical power or would it throw them into the clutches of the rich farmers and result in the emergence of new feudal lords who will hold the majority of poor farmers to ransom. Perhaps mechanization would evolve itself through different phases and that might bring about complete mechanization in a smoother fashion, than would otherwise be possible if it is tried to be achieved through a deliberate effort.

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### 9.3.2 Case for Mechanization of Agriculture

Due to the prevailing circumstances in India and other underdeveloped countries, it may not be desirable to introduce farm mechanization but we cannot deny the larger benefits which farm mechanization promises to contribute towards increased farm production and productivity.

#### **Benefits of farm mechanization**

##### **(i) Mechanization and Farm Productivity**

It is an admitted fact that farm mechanization increases the efficiency of labour as well as land and, therefore, raises agricultural production per hectare and per worker. A number of field studies conducted to establish the relationship between mechanization and productivity have revealed that mechanization increases productivity to a greater extent. New farm technology works better with mechanical inputs. Tractors can dig deeper and bring to the surface more fertile soils and contribute to greater productivity. It helps in the proper mix of new farm inputs to the advantage of a farmer.

##### **(ii) Farm Mechanization and Food Production**

With the help of machinery, farm operations can be completed in much less time than if they are to be performed manually, this increases the intensity of cropping. As argued by N.S. Jodha, the introduction of tractor in sandy areas of deficient rainfall can reduce the period of sowing operations immediately after a rainfall. This would naturally increase the food production. In those areas where water supply is assured, the farmers are making efforts to raise three to four crops from their piece of land in a year. In the words of I.Arnon, the possibility of replacing one-crop-a-year production pattern by multiple cropping is dependent on a shortening of the time involved in freeing the field from one crop and preparing it for the next one. This usually depends on the possibilities of mechanizing certain operations such as harvesting, threshing, land preparation etc.

##### **(iii) Farm Mechanization and Labour Productivity**

Mechanization increases the efficiency of labour in agriculture and raises the agricultural productivity per worker. With the introduction of machines, the quantum of labour required to produce a unit of output is greatly reduced. Increasing mechanization has helped achieve miracles in the West. For instance, in the U.S.A, the amount of human labour required to produce 100 bushels of wheat dropped from 320 hours in the year 1830 to 108 hours in 1900 by 1940. A new series of improvements have reduced labour requirements to forty-seven hours. Similarly

in Russia, mechanization has led to a substantial decrease in labour requirement. According to Russian experts, labour productivity on farms, during 1960s was three times that of the pre-revolution day. Mechanization not only

reduces the volume of labour requirement but also reduces the working hours of those who stay to work with machines and thus saves them from drudgery and provides them leisure time to relax and replenish their energies.

#### **(iv) Mechanization and Reduction in Costs**

Mechanization, as it increases the productivity of land and labour, results in reducing cost of production. Further, since mechanization and large-scale farming go side by side, economies of large-scale production and higher yield per hectare help in reducing the cost. The experience of many developed countries shows that with development, human and animal labour becomes costlier vis-a-vis the machines. According to C.H. Hanumantha Rao, technical progress and industrial development contribute in general, to increasing the ease with which capital can be substituted for labour and also reducing the cost of machines and fuel. On the other hand, economic development and the growth of per capital income raise the cost of biological sources of energy by increasing the demand for labour in the non-agricultural sector. Though it is believed that labour is cheaper in India but the study of C.H. Hanumantha Rao shows that the cause of increasing use of tractors and other machines in Punjab and Haryana is due to the fact that these machines are relatively cheaper inputs.

#### **(v) Coping with Labour Shortage**

Since farming is a seasonal industry, it involves a peak requirement of labour during certain operations of farm husbandry. For instance, when the crop is ripe for harvesting, there is greater demand for labour so that the whole crop may be harvested in time.

Sometimes, non-availability of labour may lead to the destruction of the crop. Mechanization may help in overcoming this bottleneck. For example, harvester combines have been pushed into operation in some parts of Punjab where labour shortage is felt at the time of harvest.

#### **(vi) Mechanization Leads to Commercial Agriculture**

Mechanization leads to commercialization of agriculture. If along with the mechanization of agriculture, the industrial base of the country also widens so that off-the-farm jobs multiply, agriculture tends to a greater commercialization and speeds up the pace of prosperity in the countryside. Less number of workers producing more agricultural production is an index of the changing face of things in an agrarian economy. More affluence among the farm sections helps in diversification of the rural economic activities which creates more avenues of employment and this checks urban migration which has already started becoming a serious problem in the less developed countries. With developed agriculture, farmers take decisions regarding the production and investment on the basis of price trends.

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### **(vii) Mechanization Modifies Social Structure in Rural Areas**

Traditional agriculture involves hard work and drudgery. Mechanization helps in freeing the farmers from this drudgery and allows them to enjoy more leisure and work under agreeable conditions. According to Prof. Hanumantha Rao, it may even raise the participation

rate among those who could afford to abstain from drudgerous manual work. 'The whole outlook of the farmer is changed with the introduction of farm mechanisation.' He now thinks from a wider perspective and becomes more sensitive to the factors affecting his general well-being.

Arguments in favour of mechanization on which there is a general agreement:

1. Power and equipment facilitate an increase in the yields through more timely and effective farm operations. Optimum yields of the new high yielding varieties depends on the correct seed-bed preparation, proper seeding dates, precise fertilizer placement, and the uniform and timely distribution of water and chemicals. All of these can be better provided through mechanization.
2. The possibilities for multiple cropping put a premium on speedy harvesting and land preparation so that the next crop may be planted. This gives rise to peak season labour shortages when the demand for human labour exceeds the supply. Mechanization helps output by supplementing labour during peak periods and so getting the next crop planted more quickly.
3. Mechanization reduces the dependence on draught animals which have low productivity and high costs. These animals also require fodder which utilizes land that would otherwise be available for growing food for human consumption.
4. Mechanization increases the appallingly low productivity of labour in the agricultural sector of the economy. If standards of living are to rise; this must be the ultimate concern of developing countries.
5. Mechanization lowers the cost of production by allowing more efficient utilization of land, labour, irrigation, and other inputs. This is important in terms of the overall growth of the economy because it permits the generation of savings for investment. It is also important for those countries hopping to lower costs in order to export in the world markets.

The Expert Working Group constituted by the CIAR in September 1984 made the following observation in respect of productivity as influenced by mechanization. The panel said it was possible to achieve:

- i. five to ten per cent improvement in yields by proper and timely seedbed preparations;
- ii. ten to twenty per cent improvement in yield by using seed cum fertilizer drill;



- iii. five to thirty per cent improvement in yields through control of weeds by use of intercultural tools, sprayers and dusters;
- iv. four to five per cent saving through timely and efficient harvesting and threshing operations,
- v. during the post-harvesting operations, the current eight to ten per cent loss of stored foodgrains can be saved by improved storage practices; and
- vi. lining of water courses and use of sprinklers can improve the availability of water.

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### 9.3.3 Case Against Mechanization

#### (i) Mechanization and Unemployment

Mechanization has very limited scope in these countries which are suffering from the acute problem of unemployment. Machines are always labor-saving. Any attempt to rationalize agricultural production by the introduction of labour-saving devices would throw out of employment a large number of present agricultural population. A project was initiated in Punjab by the World Bank to study the impact of mechanization on employment, which showed that there was a decline of 82.92 man hours per cropped hectare in the use of family labour on mechanized farms compared to the non-mechanized farms. Similarly, G.R. Soltani, examined the problem of labour utilization in three agricultural regions of Fars Province in the South Central Iran. He reached the conclusion that 'full mechanisation of wheat production results in the displacement of nearly 131 hours of labour per hectare.' On the basis of a study conducted in Ferozepur district, CR. Hanumantha Rao, estimates that tractorisation displaces 20 to 30 per cent of the total human labour days per cropped acre on account of tillage and transportation. A mechanical thresher displaces around 15 per cent labour and harvest combine around 25 per cent in addition to that displaced by mechanical thresher.

In the farm sector, labour is displaced by machines while the non-farm sector does not grow fast enough (in the developing countries) to absorb this displaced labour. This results in the aggravation of the already acute unemployment problem. In addition to this economic effect, which in itself has serious social implications, mechanization results in a lot of tenant farmers being converted into landless labourers. This implies that the very structure of the agricultural sector is likely to be changed in a none-too desirable direction.

These arguments have been forcefully put forward by economists Gotsch [1971] and Falcon [1970]. Others who have written on this subject include Kaneda [1969], Bose and Clark [1969] and Kitching [1967].

These issues have aroused great passion but little agreement. Drawing on the agricultural evidence by Shaw [1970], Falcon [1970] writes: Some forms of mechanization may be labour-displacing, others not. A World Bank Survey conducted in the Punjab area of West Pakistan showed that the average labour

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costs per cropped acre declined by about 40 per cent with the introduction of mechanization. Because of the higher cropping intensity, however, the actual labour-displacement per farm was only marginal, since the reduction in labour during the ploughing season was almost offset by the increase in labour during the harvesting season due to the increased output per farm IBRD, 1969.

It must, however, be realized that labour-displacement and most other problems commonly associated with mechanization arise because of the introduction of large machines such as tractors of forty or fifty horsepower. To negate the arguments against mechanization, developing countries need tractors which initially replace animals, not people, which the small farmers can afford and which can be efficiently utilized on small as well as big farms. This means that a small, inexpensive tractor is required for the small and medium-sized farms and a bigger tractor for the larger farms.

In Pakistan, only large tractors are being currently assembled and imported. These can be efficiently used on farms above 100 acres or perhaps even fifty acres with double cropping and intensive cultivation. However, they are clearly not viable for farms under fifty acres which represent ninety-eight per cent of the total number of farms (Government of Pakistan, 1960). There is obviously a need for a small tractor.

A point to be noted here is that mechanization in agriculture creates significant employment in industry. Thus, it enlarges the industrial base by promoting growth of industrial units for the manufacture of agricultural implements and machinery. In addition to the employment created for the manufactures new employment opportunities arise for maintenance and service of farm machinery.

### **(ii) Existence of Small Farms**

Mechanization of agricultural operations has limited scope in these countries of the world that have small and tiny size and irregular shape holdings. It is for this reason, that in some such countries, mechanization has crept into the stationary type of farm work and transportation but has limited application to field operations. India is known to be a country of small holdings and to that extent mechanization will have only limited application in Indian agriculture. In the event of introducing mechanization in Indian agriculture, land reforms such as would provide scope for It, shall have to be adopted at a higher scale.

### **(iii) Lack of Trained Personnel**

Application of mechanization to farm operations would also be restricted in most of the under developed countries as they lack trained personnel to handle these machines. A poor, illiterate farmer of a backward village in India will find it extremely difficult to adopt large-scale mechanization. There is also a dearth of trained mechanics who can provide repair facilities for such machines.

#### **(iv) Rapidly Increasing Fuel Prices**

Mechanization presupposes the availability of electric energy or mineral fuels. The supply of mineral fuels is very deficient in most of the under-developed countries so that it will be too costly to make use of petrol or diesel oil tractors or other machines. Unless cheap hydro-electricity is made available on the farm, mechanization is out of question.

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#### **9.3.4 Conditions for Farm Mechanization in Developing Countries**

The promotion of farm mechanization in developing countries is neither a pure agricultural production, nor a pure agricultural technology function. Effective mechanization policies require a complete adjustment of the whole agricultural production structure. The following conditions are necessary for the effective development of farm mechanization in the developing countries.

- (1) Availability of proper farm machinery. Individual farm operations are complicated, and the same machine cannot be adapted to perform all tasks. The production of different crops requires different specialized machines. If the appropriate farm machines are available, farm mechanization should be encouraged.
- (2) Proper environment for farm mechanization implies that the farmland, climate and cropping patterns must be suitable for machine operation.
- (3) Technological capability and confidence on the part of farmers to adopt mechanical farming. Farmers must know how to operate, maintain and manage farm machinery. Hence the government must be willing to train extension workers and farmers in the use of farm machinery.
- (4) Machine farming must be cheap relative to labour, if the cost of labour remains less than that of mechanical substitutes, labour intensive technology will prevail.
- (5) Sufficient capital for farmers to invest in farm machines which require heavy capital investment as well as cash resources to operate them. For a small farm in a developing country, capital constraints may effectively prevent farmers from purchasing their own machines.

If all of these five conditions are met, small farms can be successfully mechanized. To increase the efficient use of farm machines, some forms of farmers' organization, such as group farming or custom farming have to be established. Such an organization provides the opportunity to increase machine use and thereby reduce, the per unit cost of mechanical operations.

#### **9.3.5 Problems Encountered in Farm Mechanization**

Problems which arise in the course of farm mechanization frequently occur because the aforementioned five conditions cannot be met. The following are some of the common problems encountered:

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- (1) **Lack of suitable farm machines:** While some power-tillers water pumps, power sprayers and dryers in use are manufactured domestically, the more complex machines (for example tractors, repairs and combines) are imported, and they are not completely suited to local conditions. While machines for most operations of rice production are available, this does not apply for many other crops.
- (2) Dilemma faced by many developing countries **on whether to import or to locally manufacture farm machines.** The farm machine industry in Taiwan cannot supply sufficient machines at reasonable prices to meet its domestic needs because it still suffers from low quality and high prices.
- (3) **Small farm size and fragmented holdings:** The average size of farms in Taiwan is approximately one hectare and they usually consist of several scattered plots.  
  
The physical structure and size of operations often make it uneconomical for each farmer to purchase his own machinery.
- (4) **Mechanical knowledge of farmers:** Generally, the average farmer in Taiwan lacks mechanical knowledge and does not possess the skills to manage complicated farm machinery. This discourages farmers from employing machines in their farm operations.
- (5) **High prices of machines and low purchasing power:** From an economic viewpoint, the prices of machines must be relatively low before farmers find it attractive to substitute machines for labour. Also, farmers normally require credit sources to enable them to invest in machines, and small farms do not have sufficient capital for them.

### 9.3.6 Important Categories of Mechanization

Some broad types of mechanization common to many developing countries, may be described as follows:

First, there are machine which relate to a widening of resource base. These help in the actual addition to the effective physical resources. Examples of such machines are the installation of tube-wells for tapping ground water, use of crawler tractors for reclaiming forest land and tractors for land levelling etc.

Another category of mechanization comprises all those numerous mechanical means which make agronomic practices more efficient. An example is the seed-cum fertilizer planter which helps in the accurate placement of seed and fertilizer at proper depths. Another example can be cited of aerial spraying for plant protection chemicals.

The third category consists of machines which become operative when the supply of labour is temporarily unable to meet the demand. Mention may be made of reapers, threshers and combines.

Then there is an important sector of mechanization which covers the various post-harvest stages. Sometimes, it becomes necessary to dry the harvest as soon as it is reaped. This occurs when the main crop is harvested in rainy weather. In such situations, driers are an extremely important mechanism. Similarly, cold storage plays an important role in the storing of potatoes, vegetables, fruits and other perishable goods.

There is also mechanization connected with the processing industry. This includes food preservation and canning, on the one hand, and rice milling, oil-expelling etc on the other.

### **9.3.7 Scope of Mechanization in India**

India still is an under-developed country with a large population having, small and marginal holdings; illiterate and backward farmers with a low per capita income, huge cattle population and deficiency in electric energy or mineral fuels. All the arguments which we presented in making a case against mechanization are present in our country. Large scale mechanization in India would lead to displacement of agricultural labourers and thus it would further aggravate rather than solving our unemployment problem. As agricultural labour is quite cheap in India, the use of labour-saving devices is rather not desirable.

Further, our farmers with small and tiny holdings are still living hand-to-mouth existence with very little savings which they can spend to purchase farm machines. The capital resources for mechanization are not available in India.

Non-availability of sufficient electric energy and frequent price hikes of petrol and diesel by OPEC countries are another big roadblock in the use of mechanization in the agricultural sector.

This discussion, however, does not lead us to conclude that Indian agriculture should not be mechanized at all. These are some farm operations where the introduction of mechanization will be highly beneficial whereas the rest of the operations could well be performed with the help of men and animal power. Absolute non-introduction of mechanization in Indian agriculture would make it highly backward, whereas large-scale mechanization cannot be adopted due to the circumstances prevailing in the country. What is needed is mechanization in those farm operations, where manual methods are insufficient and expensive. In the Fifth Plan, a policy of selective mechanization is proposed to be adopted. The general objective would be to increase cropping intensity and farm productivity.

The present availability in terms of power is estimated at 0.4 H.P. per hectare (of which machine power is only one fourth in the country). This is extremely inadequate and will need stepping up. There is also the allied consideration that

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the new agricultural technology requires faster farm operations as well accuracy and timeliness in undertaking them.

Finally, the emerging problem of the increasing the cost of purchasing bullocks and their recurring maintenance. While all these factors underline the need for farm mechanization, the rate and form of mechanization will have to be determined, keeping in view other relevant factors such as size of holdings as well as the impact of mechanization on agricultural labour employment situation. The last consideration would be particularly relevant with regard to combine harvesters. Their introduction would be confined to the areas where there is a perceptible scarcity of labour during the harvesting season. In this respect, the Sixth plan states: 'Unrestricted mechanisation of agricultural operations will not however be in the interest of our country as it severely worsens unemployment problem' As such, a policy of selective mechanization will be adopted.

Mechanization can well be recommended for the follow of agricultural activities:

- (1) Reclamation of lands infested with deep-rooted weeds and grasses by deep ploughing with the help of tractor driven implements.
- (2) Land improvement by land levelling with the help of bulldozers and other machinery.
- (3) Construction of dams and water and soil conservation works.
- (4) For irrigation purposes.
- (5) For constructing roads in the rural areas, hauling farm produce, for processing farm produce and for plant protection practices.
- (6) For large and cooperative farms.

There is a scope for reclamation of lands in the country and mechanization can be of immense use in this regard. In the areas of rugged topography, mechanization helps in levelling the lands and making them suitable for cultivation purposes. In a similar fashion a large number of allied agricultural activities can be conveniently and speedily performed by the use of machines.

### Check Your Progress

6. What is the nature of mechanization in a labour-abundant country like India?
7. Why is the application of mechanization restricted in most of the underdeveloped countries?
8. Give two examples of farm machine techniques which makes agronomic practices more efficient.
9. How does mechanization help agriculture in rugged topography?

## 9.4 IRRIGATION

In this section, we will learn about the need, role, benefits and demerits of irrigation. Along with this, we will also look at the sources of irrigation and the government schemes related to irrigation.

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#### 9.4.1 Need for Irrigation

The necessity for irrigation arises due to the following reasons:

- (i) Nearly 70 per cent of the country's gross cropped area depends exclusively on rainfall which is unevenly distributed both in respect of time and space. The rainfall is thus most unreliable and is marked by wide variations in different parts and also variation from year to year in its quantity, incidence and duration. India is served by south-west and the north-east monsoons. Most of the rainfall (ie., about 73.7 per cent occurs during June-September); while winter rains amount only to 2.6 per cent post-monsoon rains are about 13.3 per cent and pre-monsoon rains about 10.4 per cent.

The rainfall over the country is unequal, irregular and quite often liable to complete failure. With such a wide difference in rainfall between one part and another (such as 1270 cms at Cherapunji and only 25 cms in Western Rajasthan), famines have occurred several times in the past. The areas generally affected by the variations in the rainfall are those which receive a rainfall of 127 cms and less per annum. Whenever rain fails, i.e., when it is less than 80 per cent of the average, or when it does not occur at the proper crop season, production falls. If deficiency of rainfall is 40 per cent or more, famines occurs and crops do not even grow. To banish famines, the only remedy is artificial supply of water to the lands through irrigation. Sone canal command area and the Krishna and Godawari Deltas, which are today the granaries of rice, used to be famine-ridden only a few years back. Irrigation is the antidote to famine.

- (ii) Irrigation is deemed necessary for the maximum production of most farm crops, especially in the arid and semi-arid regions. Even in the areas of high rainfall irrigation of second and third crop or for multiple cropping when rainfall fails.

According to the I.C.A.R. the production of irrigated crops is on an average 50 to 100 per cent higher than that of the unirrigated crops in the same locality.

- (iii) In India, the growing population demands higher quantities of foodgrains for its consumption, but in the absence of which imports ranging from 150 to 200 crores of rupees per annum have to be made. To cut short imports, self-sufficiency in foodgrains is very necessary.

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This can be achieved, besides putting various inputs in the fields, by increasing irrigation facilities. In fact, among the measures that may be adopted for increasing the area under cultivation and the yield of crops, the first place must be given to the works for the supply and conservation of water.

- (iv) At present 20 per cent of the cropped area of the country is under cash crops, which produces 30 per cent of the country's production commanding 33.3 per cent of the total value of agricultural products. Only about 12 per cent area under cash crops is irrigated at present. As is known cash crops ensure employment through industries and about 60 per cent of the annual foreign exchange earnings come from these products (pepper, spices, tobacco, cashewnuts, cotton, jute and oilseeds etc). Therefore, their productivity can be stepped up through provision of increased irrigation facilities. With regard to cereals, where the mean percentage variation in production from year to year is large, improvement in irrigation facilities leads to higher yields. Water requirements of crops depend primarily on climatic and soil factors. Crop season in India is predominantly **kharif** followed by **rabi**. Kharif is the the agricultural season in which monsoon rains are prevalent, with crops sown in June and July and harvested in September and October. Rabi is the agricultural season in which rain is scarce and only irrigated crops are grown, with crops sown in October and November and harvested from March to May. During *kharif*, the monsoon meets a substantial part of water equipments of crops. Within limits some extra moisture success does not seriously affect the yield. Deep rooted crop can tolerate longer cry spells than the show rooted ones. Similarly, hot weather crops use up water at a faster rate than rabi and *kharif* crops because of the higher rate of transpiration in summer.
- (v) Different crops require different quantities of water supply throughout their growing period for example, grain crops require their maximum supply during the time ear-heads are formed; while sugarcane, cotton, chillies require more water. Most annual crops do not require water when they are maturing.
- (vi) The need for irrigation also arises from the fact that in spite of considerable advantages of the soil, sunshine and climate, crop production in India is not so efficient as in other parts of the world, especially because of the lack of moisture in the soils. Sandy soils require frequent water than the alluvial or black soils. In the season, enough residual moisture is not available in the soil to support multiple cropping. It cannot be over-emphasized than to state that 'a sadder commentary on our economic situation cannot be found than the close, direct correspondence between harvests and mortality and the security of harvests depend primarily upon the adequate supply of water.'



- (vii) Many of the Indian rivers are not perennial and carry insignificant flows in the rabi season. Besides, there is a wide disparity in the water flow from year to year too. In the case of snow-fed rivers in the north, the flows are normally perennial, but the variation between the winter and the monsoon flows may be as much as one to 100 in the main rivers traversing the plains and as much as one to 300 or more small hill streams. The characteristic of central and southern rivers is that there are more small hill streams. The characteristic of central and southern rivers is that about eighty to ninety per cent of the annual run-off takes place during four months of the monsoon rains. The rivers are largely dry during the remaining eight months of the year. It is obvious, therefore, that to make use of a sizeable portion of the average annual run-off, large storage capacities are needed. Through conservation of the surface water, parched lands may be watered round the year so that multiple crops can be grown the year around. Fortunately, efforts have borne fruit in this respect. For example, Bhakra Dam on Sutlej conserves 45 per cent of the river flow and irrigates about 14.56 lakh hectares; Nagarjunsagar on Krishna holds water to serve 8.90 lakh hectares, Chambal Dam serves 5.56 lakh hectares. Some of the other projects which serve and supply water through mere diversion structures on the perennial rivers are the Gundak which will supply water to 14.56 lakh hectares, Kosi supplies 7.28 lakh hectares, besides 3.23 lakh hectares on the Western Kosi Canal when it is completed. The Sona Barrage serves 2.83 lakh hectares. These storages have helped and will further help in moderating floods, preventing large scale destruction of property crops and life.
- (viii) India has vast ground-water reserves especially in the Gangetic plain. Narmada basin and deltaic areas, that is in about 40 per cent of our country's sown area. According to Dr. G.C. Chatterjee, the average annual rainfall in India is  $3 \times 10^{12}$  m<sup>3</sup>, about  $801 + 109$  m<sup>3</sup> of the water seeps down annually in the soil. Of the quantity seeping into the soil, only  $370 \times 10^9$  m<sup>3</sup> of water percolates down to replenish the ground water body. The total storage of ground water down to 305 metres has been estimated at  $37,000 \times 10^9$  m<sup>3</sup>. We are still using only  $22 \times 10^9$  m<sup>3</sup> of the ground water. Therefore, large scope exists for the development of these underground water resources.
- (ix) India's total geographical area of 328 million hectares lies in tropical and subtropical zones. As mentioned earlier, 140.1 million hectares is net sown area and 198.4 million is the gross cropped area.
- (x) The total land area in the country under food crops is 118 million hectares. The productivity differs considerably from zone to zone and from state to state.
- (xi) Lastly, in good rainfall areas (like Assam, West Bengal, Orissa, Andhra Pradesh, Tamil Nadu and Kerala) irrigation is required mostly as a supplemental need to protect their single crop agriculture against occasional

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drought. In Karnataka, Gujarat, Maharashtra and Bihar too, the predominant crops receiving irrigation benefits are that of paddy and to a lesser degree that of sugarcane percentage of other irrigated crops being comparatively small. It is only in Punjab, Haryana, Rajasthan, M.P, Gujarat and North Western U. P. where irrigation is used extensively for other seasonal crops as well.

Development of adequate and dependable irrigation facility is therefore very essential to banish famines. As a result of drought conditions, irrigation alone supplies dependable and timely supplies water. In the absence of irrigation the farmer cannot risk his investment on other inputs which contribute to increased productivity. Thus, irrigation has necessarily a crucial role to play in the country's agricultural production strategy.

It may however, be noted that irrigation can yield best results only if it is accompanied by other factors such as suitable change in the cropping pattern. improving and maintaining the fertility of soils, use of improved varieties of crops, application of chemical fertilizers and green manuring, adoption of plant protection measures and improved cultural practices and many other allied matters. These will yield results only when sufficient water supply is available.

### 9.4.2 Vital Role of Irrigation

Irrigation has proved beneficial to the country. In fact, it forms the datum line for sustained successful agriculture. It alleviates suffering, preserves life, averts famines and advances the material prosperity of the country in fact, as pointed out by Sir Charles Trevelyan, 'irrigation is everything in India'. Water is more valuable than land, because when water is applied to land, it increases its productivity at least six fold and renders great extents of land productive which otherwise would produce nothing or next to nothing.' Dr. Knowles writes: 'The irrigation works have made security of life, they have increased the yields and the value of the land and the revenue derived from it. They have lessened the cost of famine relief and have helped to civilize the whole region. In addition, they yield handsome profits to the government.'

Dr. Gadgi's survey of the economic effects of the Godawari and Pravara canals in the Deccan has shown that the total direct and indirect effects of the irrigation projects were very favourable. Due to irrigation, farmers could make additional investments in cattle, farm implements and on more valuable crops like sugarcane and the total employment of the farmers and labourers was greater.

### 9.4.3 Benefits of Irrigation

As a result of the studies undertaken in 1958 and 1961, in eleven projects from each of the regions it was observed that 'canal irrigation has helped in promoting the greater utilisation of land; enlarging the average size of the farm;

generating demand for additional farm labour; shifted in new and better varieties of crops increasing the additional productive investment in farm business, favourable input-output ratio, widening the scope for increase in land revenue and other local receipts. In addition to direct benefits, there are also secondary and tertiary benefits, e.g. canal irrigation has led to a general expansion of secondary and tertiary activities in the area affected by it resulting in greater work opportunities; more employment to both family and hired labour; higher value of output per industrial unit, and higher turnover of business establishments in the project areas.'

The purpose of irrigation is to help increase agricultural production from the lands served. The service provided by irrigation may be viewed from two angles. viz.

- (a) Protective aspect to make up for the moisture deficiency in soils during the cropping season so as to ensure proper and sustained growth of the crops grown.
- (b) Additional land use aspect to enable a second or third crop being raised on the lands provided with irrigation which could otherwise not be cultivated efficiently, more particularly during the post or pre-monsoon period. While the protective aspect helps to stabilize agriculture production against droughts, the second facility i.e., land use aspect helps in overcoming low productivity due to dryness or excessive water supply. Irrigation development in India in the past had mostly taken place as a measure of drought relief. Famines fathered the idea of artificial irrigation. Irrigation work was built, designed and operated mostly on a defensive pattern. With the population swelling rapidly, irrigation has now to have a new purpose increased agricultural production. The yields in the irrigated areas are said to be 60 to 100 per cent higher than in other areas. Irrigation by helping the plant to take up the manure in a suitable form leads to increase in fertility to increase in corn yields.

#### **9.4.4 Demerits of Irrigation**

Irrigation water when misused spoils the soil beyond repair. Author, Mr. Pugh traces back the history of the arid regions and remarks that soil civilization in the Middle East disappeared because of misuse of irrigation water. Agricultural Reorganisation Committee UP. (1949), pointed out that at some places yield of crop decreased due to irrigation water. This is due to: (a) greater demand on soil nutrients to produce higher yields (b) the leaching effects of irrigation; and (c) collection of injurious salts in the upper layers of the soil.

The important fact to be noted is that whenever water is available to the cultivator for irrigation he invariably resorts to over-irrigation under the mistaken belief that the higher the application, the higher the yield and, also the feeling that

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he must make the fullest use of the water for which he has paid. Experimental studies undertaken by Shri A.P. Bhattacharya (in Sarda Canal area), have given convincing proof that over irrigation is harmful from the point of view of lowering of yields because the unused water not consumed by the plant brings down plant nutrients, while percolating to the ground water table, which keeps on being augmented ultimately leading to waterlogging which in its turn brings malaria along with complete loss of fertility. A rough estimate shows that the yearly loss to the country is of the order of ₹ 40 crore, apart from the long term effects of water logging and malaria.

### 9.4.5 Sources of Irrigation

It may be noted that the systems of irrigation developed in different parts of the country is governed by local, meteorological, geological and other physical conditions. Therefore, there cannot be any uniformity in the system of irrigation in different tracts. Alluvial tracts in the Gangetic and coastal plains is especially suited for canals and wells, in crystalline areas of the Deccan Plateau irrigation from tanks is most extensive and in the northern parts and black cotton tracts of Deccan, sub-montane regions of the eastern and western sides of the Western Ghats and the Punjab, a considerable proportion of land is irrigated by wells.

Of the area irrigated more than half depends for its irrigation supplies on minor works. Rest of the area is irrigated from river canals, their distributaries and channels, all of which are included under medium and major irrigation works. The following table shows different sources of Irrigation available in India. Table 9.2 shows that area irrigated by Government canal and tubewells has increased considerably.

**Table 9.2** Area Irrigated by Sources

(In million hectare)

Source	1950-51	1960-61	1970-71	1980-81	1990-91
Govt. Canal	7.2	9.2	11.9	14.5	16.4
Private Canal	1.1	1.2	0.9	0.8	0.5
Tanks	3.6	4.7	4.1	3.2	3.2
Well and Tube well	5.9	7.2	11.9	17.7	24.2
Other Sources	3.0	2.4	2.3	2.5	3.1
Total Net Irrigated Area	20.8	24.7	31.1	38.7	47.4

**Source:** Indian Agriculture in Brief.

Gross and net irrigated area has increased during the plan period. From the Table 9.3, it can be inferred that the area irrigated is served by canals, tanks, tubewells and other sources. At the beginning of the planning canal system was the most important source of irrigation.

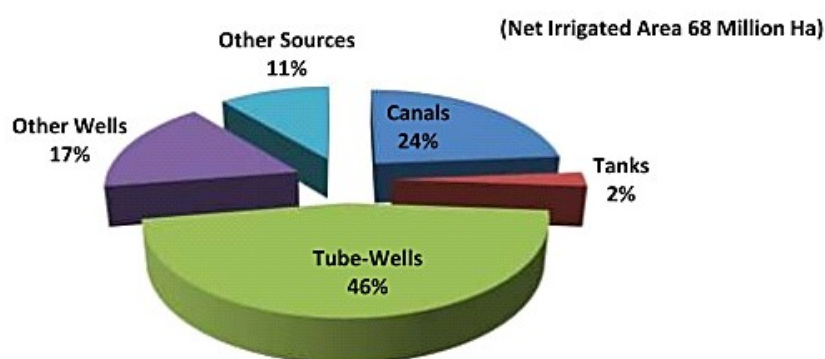
**Table 9.3** Area Irrigated by Sources  
(Percentage)

New Agricultural Strategy  
and Green Revolution

Source	1950-51	1960-61	1970-71	1980-81	1990-91
Govt. Canal	34.3	37.2	38.5	37.4	34.6
Private Canal	5.5	4.9	2.9	2.1	1.1
Tanks	17.3	18.5	13.2	8.3	6.8
Tubewells and other wells	28.7	29.7	88.1	45.5	51.0
Other Sources	14.2	9.8	7.3	6.7	6.5
Total	100.0	100.0	100.0	100.0	100.0

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During the plan period the relative importance of various sources of irrigation has changed. In 1950-51 about 34.3 per cent of the net area sown was irrigated by canals. Area irrigated by tubewells and other wells was only 28.7 per cent of the net cropped area. The area irrigated by tubewells and other wells increased 51 per cent in 1990-91. This source of irrigation occupies the most important place in the irrigation system. Tanks supply a comparatively small proportion (6.8 per cent). Other sources are of minor importance, with only 7.0 per cent.



**Sources:** Status of Indian Agriculture 2017

**Fig 9.1** Net Irrigated Area under different Sources 2014-15

## Major and Medium Irrigation Schemes

During 1950-51 and 1973-74, ninety-seven major and 513 medium irrigation schemes were taken up. Of these twenty-two major and 358 medium schemes were completed and the rest spilled over to the Fifth Plan. During Fifth Plan, sixty-four out of seventy-five major and all the 155 medium schemes will be completed. Besides, work will be initiated on 109 major and 313 medium irrigation schemes. The total investment on major and medium irrigation projects between 1951-52 to 1976-77 was ₹ 4595 crore, and that for the Fifth Plan being ₹ 3,135 crore. The outlay for 1977-78 is ₹ 989 crore.

The importance of major and medium irrigation works lies in the conservation of the surplus and flood waters. Mere concentration on minor irrigation schemes would lead to a great waste of total usable water that is yet untapped. Only major

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and medium projects can be utilized as a safeguard against floods and these alone can be developed as multi-purpose projects which may serve, not only the purpose of irrigation but also that of hydro-power generation, supply of domestic water, navigation, fish culture and recreation facilities.

But major and medium irrigation projects at the same time, suffer from certain drawbacks. A large number of pre-requisites are needed for their successful implementation. Firstly, they need a vast amount of capital expenditure for capital requirements and resettlement. Secondly, the loss in distribution system when distributaries are not lined, amount to about 40 per cent of the total water left in the channels. Thirdly, a large area might suffer from the problems of waterlogging needing vast amount of money for reclamation purposes. Fourthly, the catchment area of the dams needs protection from soil erosion, otherwise the dam may be silted very soon and go out of use. Fifthly, such schemes involve more time in investigation, planning and construction and the gestation period is even large. Finally, they are less reliable for timely supply of water.

### **Minor Irrigation Works Schemes**

Minor irrigation programmes relate to the development of groundwater resources on scientific lines. Such programmes include: (i) surface water schemes such as small stream diversions; (ii) rain storages in small catchments; (iii) renovation of existing tanks and diversion works; (iv) ground water tapping, boring of wells, deepening of wells, sinking of tube wells lifting of water from the wells; (v) construction and repair of small drainage channels, for conserving moisture and replenishing growth water.

Under the new definition, all ground water structures are classified as minor irrigation. Ground water development is under private sector to the extent of 90 per cent.

Minor irrigation schemes have a great advantage in that they get yield results promptly: (i) they can be conceived and completed quickly and handled to a large extent by the cultivators themselves (ii) the construction, period is hardly fifteen days to one month; they need small outlay of capital and mostly use local talents and resources (iii) the utilization of the irrigation potential is almost immediate, (iv) since these works are owned by the cultivators themselves they bring major satisfaction of the psychological and the physical needs of the cultivators (v) since the cultivators know fully the capacities of these works, water supply from these can be more reliable, so that they may adopt a cropping pattern to suit their needs (vi) as the utilization of water in these cases is usually confined to the area very near to the sources, loss of water and its distribution is very much reduced (vii) these are essentially people-centred programmes which provide scope for individual as well as co-operative efforts, (viii) the cost per hectare of minor irrigation is lower than in major irrigation. (ix) ground water has the great advantage in that it is doubtful and can be freely stored and freely move underground so that the loss

by evaporation and seepage both during storage as well as during conveyance and (x) minor irrigation system does not require a large army of men to maintain and operate it.

Depending on feasibility major, medium and minor schemes and their role in decided.

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### Check Your Progress

10. What are the direct benefits of canal irrigation?
11. What is meant by the protective aspect of irrigation?
12. Which conditions govern the systems of irrigation developed in different parts of the country?
13. Why is over irrigation harmful from the point of view of lowering of yields?

## 9.5 HIGH YIELDING VARIETY OF CROPS

Of all the methods of improving agricultural technique, none has brought about such progress as the improvement of plants through selection and cross breeding. These methods of improvement entail considerable expense and constant care, whereas the use of improved varieties of seeds only involves the agriculturist in slight extra expense represented by the surcharge of a few rupees per capita of seed. The introduction of a better variety in an agricultural area means an immediate profit for the agriculturist. It improves the crop either in quantity or in quality while scarcely increasing the cost of cultivation. The creation of variety with an improved yield and quality is, therefore, one of the simplest and most effective means of raising the general level of the country's economy. The methods of producing better varieties include the introduction of new forms, selection from variations occurring in nature and from those artificially induced by hybridization of plants and indeed all those means by which conscious improvements of plants may be accomplished. In the production of 10 to 15 per cent can be obtained from improved varieties.

Plant genetics is advanced enough to develop seeds strains almost to order. Nature's slow process of mutation has been speeded up by irradiation of seeds with radio isotopes and selecting strains with the desired qualities. Indian scientists have produced strains which are not only prolific yielders but also flood-resistant, drought-resistant and disease resistant and which mature early. These are meeting the conditions of water logged areas, semi-arid tracts and the requirements of the multiple cropping.

### 9.5.1 Importance of HYV Seeds

Demonstrations have revealed that the natural average yield of rice was 1.15 tonnes per hectare. In 1971-72, 85 per cent of the national demonstration

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plots with HYV seeds gave a yield exceeding 4.5 tonnes. The figures of wheat were 1.31 tonnes per hectare on 81 per cent of the plots in 1971-72. The analysis of the yield data reported from various states indicated that as compared to traditional varieties, the yield of these varieties was significantly higher. The higher yield of paddy touched the level of 13,000 kgs per hectare (1 R 8 in Karnataka) and the average yield in different states ranged between 2,100 kgs and 5,500 kgs per hectare. In the case of hybrids, yields as high as 7,835 kgs, 7,500 kgs and 6,527 kgs per hectare were obtained for maize, jowar and bajra respectively.

The per hectare yields of maize ranged between 1,404 kgs and 3,500 kgs in different states and those of hybrid bajra ranged between 1,300 kgs and 3,875 kgs and of jowar between 1,275 kgs and 3,767 kgs.

However, several administrative, organization and institutional problems faced in the implementation of the programme of high yielding varieties were identified during the evaluation studies conducted by the Planning Commission and Agro-Economic Research Centres. The problems included the provision of additional facilities in certain research laboratories for the strengthening of fuller utilization of available soil testing facilities puts a greater emphasis on demonstration and improvements in training programmes, better publicity popularization and use of treated seeds quality control of fertilizers and pesticides and increased supply of institutional credit.

### 9.5.2 Some Improved Varieties

Quite a large number of improved varieties of foodgrains have been evolved which have helped in boosting up the production of foodgrains. The All-India Co-ordinated Project on Improvement of Wheat, has evolved new varieties which have a high degree of resistance to all types of rust and which mature earlier than the older varieties. Research work has been carried out at twenty centres. The varieties evolved are suitable for rain-fed conditions particularly in central and western regions of the country comprising Punjab, Haryana, Rajasthan, M.P., UP., North Bihar, Gujarat and Maharashtra. Most of the varieties ripen within 120 to 140 days and their yield potential varies from 20-25 quintals to as much as 70-80 quintals per hectare.

Based on field trials, the following varieties of wheat have been considered suitable for rain-fed as well as high fertility conditions: Larma Rajo Sonara 64 Sharbati Sonara Kalyan Sona Sonalika S 311 Chotti Lerma) Safed Lerma Hira (H D-1941) Narmada-4C Meghdoot (H 1-7483) H S 1097-11 Moti Pusalerma UP 215 UP 310 HD 1925 HD-1982 HD-1999 HD 4502 and W.G.-377. Some of these are of short duration, while others are late sowing varieties and are grown where irrigation is available even up to the middle of January after the harvest of sugarcane, potato, tori, radish, carrots or turnips.



Even more heartening are some of the exotic varieties of paddy, which can stand high doses of fertilizers and give yields ranging from 3500 kgs to 7500 kgs per hectare. So far more than 400 superior varieties have been evolved, which give 10 to 20 per cent more yield. The All-India Coordinated Rice Improvement Project is involved in bringing out new varieties of dwarf and high yielding ability. Many of these varieties are of better grain quality, early maturing and drought resistant; while others are susceptible to severe diseases (bacterial leaf blight) pests, (stem borers and leaf and plant hoppers) unsuitable under water-logged conditions, coarse glutinous grain and poor consumer acceptance.

Therefore, now such varieties are being raised which are devoid of these problems. The main varieties suitable for general cultivation are IR-8, Jaya, and Vijaya. Those suitable for specific regions are Bala, Cauvery, Kandi, Krishna. Padma, Pankaj, and Jagganath. The varieties for special situation are Sabarmati Jamuna, Ratna, and IR- 20. Other six dwarf varieties for specific regions are Hamsa, Annapurna, Karuna, Sarju- 49, Suma and Kusuma.

The All India Coordinated Project on pulse crops was undertaken in 1967 with a view to evolve quick yielding varieties which can be fitted into suitable multiple cropping and relay cropping patterns in areas with assured irrigation and also high yielding strains which are resistant to pests and diseases. The IARI scientists have developed a new short duration (seventy-five days) variety of green gram (viz, Pusa Baisabhi) for growing between rabi and kharif crops yielding over a ton of grain per hectare.

About 7,000 varieties of vana (Bengal Gram) have been under trial at IARI. Besides, thousands of varieties of Arhar, Moong and other pulses have been screened in the regional centres at Hyderabad, Coimbatore, Jabalpur, Ludhiana, Varanasi. etc. Under coarse grains, new varieties of maize, bajra, jowar and sorghum have been evolved under the programmes of the All India Coordinated Millets Improvement Project.

Six hybrids HB-1 to HB-4 of bajra and two others have been released which take about seventy-five days to mature and give yields of about 4000 kgs. per hectare. But these strains are subject to pests and diseases and hence have not been very popular. However, efforts are on the way to overcome these problems. Two hybrids CSH I and CSH II of jowar have been evolved. These take about three to four months to mature and yield about 4000 to 6000 kgs per hectare. But these have not found much favour with the cultivators because when they are about to mature rains deteriorate the quality of the grain and some of these hybrids are not suitable for high rainfall areas; and they also do not meet the consumer demands. A number of high yielding hybrids and composite varieties of maize have been evolved under the All-India Coordinated Maize Breeding Project, such as the Ganga 101, Ganga-3, Ganga-Safed 2, Ranjit, Deccan, Himalayan 123 and Hi. Starch. These mature between eighty-five to

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120 days and give about forty-five to seventy-five quintals per hectare. They have been adopted in some areas like the northern plains; Southern Rajasthan, Gujarat and Maharashtra, and in some parts of Deccan, but in others there has been considerable resistance from the farmers because the available varieties do not fit in well with the existing pattern of rabi crops and, moreover, they are non-resistant to pests and diseases.

As far as oil seeds are concerned, high yielding and early maturing varieties have been for castor (Aruna CSH—2, Suphala), groundnut (M-13) C— 148 and KG-6 1- 120); rust-resistant varieties of linseed, and high yielding tall and dwarf hybrids of coconut.

To meet the increasing requirements of edible oils in the country, large scale cultivation of soyabean is undertaken in Maharashtra, Gujarat. UP. and M.P. Sunflower is also being grown over large areas in the country particularly of the Russian variety, in Tamil Nadu, Maharashtra, Karnataka, Andhra Pradesh, Gujarat and some parts of North India.

Demonstration schemes for castor summer-irrigated groundnut and implementation of aerial ground spraying of other oil seeds is also under way. Superior strains of sugarcane have been evolved at Coimbatore, which are more vigorous and good yielders. Co— 312, Co 313, Co 419. Co 421, Co 427, Co 527, Co 453, Co 8 and Bo 11 are important varieties. But because of the low rate of multiplication of seed and tardiness in the adoption, its popularity has been a problem.

A large number of improved types of arboretum, herbaceous and American - varieties have been evolved under the Central Cotton Committee such as the Kalyan. Vijaya Laxmi, Pratap. Virnar, Jarila Jayther, Garoni Uganda, K-2, K— 5, N-14, C-1, C- 12, F-216, F-231. R 420, Malwa 9, and Indore 1. But many new varieties have now been developed by IARI MCU-5 (Sujata and Swin), Gujarat Hybrid 4; Varalakshmi, PR 9. PS 10 and SS 67 are not only short of duration, but also long-staple, superior cotton with high ginning capacity. These are being raised in the command areas of Rajasthan Canal, Tungbhadra and Nagarjunsagar.

Under fodder crops Pusa Giant Napiergrass gives 2500 to 3000 quintals of green matter per hectare per year. It contains 25 per cent more protein and 12 per cent more sugar than the Napier grass, Pusa Giant I Berscem gives an additional 900 to 1000 quintals of green fodder per hectare per year and is frost-resistant. In the field of horticulture and vegetables, improved varieties giving good performances as regards yields and freedom from diseases have been evolved.

Important among the vegetables are tomato, brinjal, bottle gourd, sweet potato, garden peas, field peas, cabbage, cauliflower, turnip, carrot, *Khol Khol* lady's finger and many others.

Among the fruits, the development of crops like nuts (almond and walnut) has been promoted in the Himalayan region. Grape cultivation has been given a

fillip in the Deccan and peninsular India with a new promising variety Anab-e-Shahi. Another variety Pusa Seedless is now being cultivated in Delhi region.

Besides many foreign vegetable crop varieties and fruit trees have been released for commercial cultivation. Important among these are high yielding tomato and garden varieties from the U.S.A., cowpea variety from the Philippines varieties of water melons from the U.S.A. and Japan, and a pea variety from Australia. Sugarbeat is also being cultivated efficiently in Punjab, Rajasthan, U.P., Haryana and in selected areas in Maharashtra.

### **9.5.3 National Seeds Corporation**

This corporation was established in 1963 mainly as an organization to produce, stock and supply foundation seeds for hybrids particularly hybrid maize which were released by that year. The Corporation launched a major programme of seed production of certified seeds of hybrid maize, hybrid jowar, hybrid bajra and Taichung Native I in December 1965 and January 1966.

Seven regional units of the corporation have been set up in different parts of the country to facilitate timely supply of parent seeds, and to provide technical guidance and seed and inspection and certification of hybrid seed crops. Fourteen processing plants have also been set up to facilitate the processing of seeds. Each plant has a capacity of nearly 3,000 to 4,000 quintals per year. It has also popularized land levellers and planters by providing these on lease, the Corporation has been providing besides hybrid seeds of maize, jowar, bajra, rice etc., vegetable seeds also, such as Pusa Sawani bhindi, Pusa Rubby tomato, Pusa Purple Long brinjal, Pusa Katki cauliflower, new Pusa Chillies, Guntur 3 chillies Coimbatore long Karela Bonnervile and Perfection New line peas and Asiriya Murtunde groundnut.

The Terai Development Corporation, set up in 1869, has made appreciable progress in production of seeds particularly of paddy, maize, sorghum and soya beans.

Genetic manipulation of seed has brought the 'era of choice' in seeds. This has opened new vistas for the domestic farmers.

There are a number of on-going programmes like setting up seed processing plants, development of seed farms strengthening of seed testing laboratory and creation of additional storage capacity. These would continue to receive attention during the Seventh Five Year Plan. Also, for meeting the emergent needs of seeds in different states the programmes for building up buffer stocks of seeds by the National Seeds Corporation and reserve stocks of seeds by the Governments would be taken up on a larger scale.

Seed development programme of the country is an important area for the modernization of Indian Agriculture. Government of India, State governments, Cooperatives and Private sector institutions are contributing towards the production of quality seeds in the country.

## **NOTES**

### 9.5.4 Progress of Area Under HYV

#### NOTES

Ever since the introduction of new techniques of farming under the Green Revolution, there has been an increase in the agricultural production. There are various factors which are related to the cultivation of high yield variety seeds. Hybrid seeds are preferred for their disease resistance and high productivity. But for their cultivation, supplementary facilities like water and chemical fertilizers. This is why it has been observed that in India, only irrigated regions have seen the progress where areas under HYV seeds are concerned. Rain fed, flood prone and upland or lowland areas are still uncovered. Let us see, what has been the status of progress of area under HYV seeds cultivation. We will look at the trends in the area under four major crops in which High yielding variety seeds are being used: wheat, rice, jowar and maize.

**Table 9.4** Area of High Yielding Variety of Wheat

		('000 hectare)							
State	Season	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
1	2	3	4	5	6	7	8	9	10
Assam		-	-	-	-	-	-	-	-
Bihar		1516	1637	1582	1470	1473	1479	1564	1608
Chhattisgarh		21	57	62	67	41	41	40	42
Gujarat		260	409	390	731	641	744	1023	1222
Haryana		-	-	-	2290	2288	2290	2345	2390
Himachal Pradesh		-	-	-	-	-	-	-	-
Jammu & Kashmir		170	149	110	143	140	131	131	131
Jharkhand		107	-	-	-	-	-	-	-
Karnataka		-	134	123	101	120	147	182	177
Madhya Pradesh		1220	1751	1603	2269	2405	1965	2425	2457
Maharashtra		689	680	710	622	724	924	1231	1253
Orissa	Summer	8	7	4	5	4	3	4	5
Punjab		-	-	-	-	3482	3468	3467	3488
Rajasthan		1821	1859	1450	1528	1350	1796	2320	2199
Uttar Pradesh		-	-	-	-	-	-	-	-
West Bengal		-	-	-	-	-	-	-	-
Delhi		28	26	20	19	13	8	13	13
Blank (-) Not available with State Agricultural Statistics Authority (SASA)									
Source: Consolidated results of Crop Estimation Survey on Principal Crops- Published by NSSO									

#### Area Under HYV of Wheat

One of the top agricultural products of India is wheat. This is mainly a rabi crop which is sown in winters and harvested in spring. As per the NSSO survey from the year 2000-08, the state with the maximum area under high yielding variety of wheat in India has been Punjab with an estimated area of 3488 thousand hectares under HYV as of 2007-08. There has not been much change in the area between 2000 and 2008. The states which have seen an expansion of area under HYV wheat are Chhattisgarh, M.P., Maharashtra and Rajasthan, where there has been approximately double the expansion of area between 2000 and 2008. The maximum increase in area under HYV has been observed in Gujarat where the jump in the area under HYV has gone from 261 thousand hectares in 2000-01 to 1222 thousand hectares in 2007-08. There are also states like Jammu and Kashmir and the Union Territory of Delhi which has seen a decline in the area under HYV

wheat, where Delhi has shown a contraction from 28 thousand hectares in 2000-01 to almost half in 2007-08.

*New Agricultural Strategy  
and Green Revolution*

**Table 9.5 Area of High Yielding Variety of Rice**

('000 hectare)									
State	Season	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
1	2	3	4	5	6	7	8	9	10
Andhra Pradesh	Kharif	-	-	-	-	-	-	-	2554
	Rabi	-	-	-	-	-	-	-	1270
Assam	Autumn	-	-	-	-	-	-	-	-
	Winter	-	-	-	-	-	-	-	-
	Summer	-	-	-	-	-	-	-	-
Bihar	Bhadai	-	-	144	-	-	-	-	-
	Aghani	1649	1608	1583	1556	1411	1525	1636	1732
	Garma	88	94	119	88	80	76	87	92
Chhattisgarh		581	637	981	736	732	812	882	907
Goa	Kharif	33	30	31	35	35	35	36	34
	Rabi	16	16	16	17	17	17	17	18
Gujarat	Kharif	424	576	374	458	518	515	-	604
	Summer	-	3	9	22	10	20	26	24
Haryana		-	-	-	690	741	784	798	824
Himachal Pradesh		-	-	-	-	-	-	-	-
Jammu & Kashmir		183	140	121	141	162	127	127	127
Jharkhand	Aghani	-	-	-	-	-	-	-	-
Karnataka	Kharif	875	867	805	743	877	906	906	883
	Rabi	45	47	44	50	41	42	41	38
	Summer	310	274	72	74	209	363	284	324
Kerala	Autumn	84	79	98	93	98	91	76	73
	Winter	89	103	112	110	116	111	112	84
	Summer	53	40	40	36	35	22	35	45
Madhya Pradesh		154	182	124	123	136	176	169	155
Maharashtra	Kharif	1412	1325	1282	1312	1342	1331	1459	1534
	Summer	-	-	-	-	-	-	-	-
Meghalaya	Autumn	-	-	-	-	-	-	-	-
	Winter	-	-	-	-	-	-	-	-
Orissa	Autumn	400	432	404	450	434	436	439	451
	Winter	2022	2153	2086	2185	2276	2341	2409	2488
	Summer	207	272	178	253	293	325	315	333
Punjab		-	-	-	-	2549	2639	2621	2610
Rajasthan		121	114	59	90	91	94	87	105
Tamil Nadu <sup>a</sup>	K/K/S	-	-	-	-	-	-	-	279
	S/T/P	-	-	-	-	-	-	-	-
	N/K	-	-	-	-	-	-	-	-
Uttar Pradesh		-	-	-	-	-	-	-	-
West Bengal	Aus.	-	-	-	-	-	-	-	-
	Aman	-	-	-	-	-	-	-	-
	Summer	-	-	-	-	-	-	-	-
Dadra & Nagar Haveli		10	7	6	9	9	5	9	12
Delhi		6	6	6	7	9	8	8	8
Daman & Diu		1	1	1	1	1	1	1	1
Pondicherry	I-Kharif	6	6	5	6	6	5	5	4

## NOTES

### Area Under HYV of Rice

Another crucial crop in the Indian agriculture is rice, which is a kharif crop. It is sown and harvested in the monsoon season. As per the data available, the top states where area under HYV rice is concerned are Andhra Pradesh, Orissa, Punjab and Bihar. Area under HYV rice has not seen many changes in the time period between 2000 and 2008. Most of the states have seen positive trends in the areas under HYV. The biggest expansion of area under HYV rice has been in the state of Orissa where it was 2022 thousand hectares in 2000-01 and has risen to 2488 thousand hectares in 2007-08.

**Table 9.6 Area of High Yielding Variety of Maize**

('000 hectare)									
State	Season	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
1	2	3	4	5	6	7	8	9	10
Andhra Pradesh	Kharif	-	-	-	-	-	-	-	105
	Rabi	-	-	-	-	-	-	-	-
Bihar	Bhada	106	92	104	105	105	119	108	109
	Rabi	-	-	188	-	-	-	-	-
	Garma	105	113	-	103	111	121	131	138
Chhattisgarh		-	-	-	-	-	-	-	-
Gujarat		227	268	222	249	320	305	-	307
Haryana		-	-	-	8	10	8	6	6
Himachal Pradesh		-	-	-	-	-	-	-	-
Jammu & Kashmir		82	46	90	71	47	40	40	40
Karnataka	Kharif	595	500	574	544	779	839	864	1013
	Rabi	51	61	50	47	55	80	78	75
	Summer	11	9	-	-	9	-	16	20
Madhya Pradesh		-	-	-	-	-	-	-	-
Maharashtra	Kharif	-	-	-	-	-	-	-	-
	Rabi	-	-	-	-	-	-	-	-
Orissa	Autumn	22	26	14	26	31	35	35	45
	Winter	0.13	0.04	0.07	0.62	2	6	6	6
	Summer	1.00	0.40	1.00	2.00	2	2	2	3
Punjab		-	-	-	-	100	104	115	103
Rajasthan	Kharif	313	386	428	498	444	544	590	667
	Rabi	-	-	-	-	-	-	-	-
Tamil Nadu		-	-	-	-	-	-	-	213
Uttar Pradesh		-	-	-	-	-	-	-	-
West Bengal		-	-	-	-	-	-	-	-
Blank (-) Not available with State Agricultural Statistics Authority (SASA)									
Source: Consolidated results of Crop Estimation Survey on Principal Crops- Published by NSSO									

### Area Under HYV of Maize

Maize is third most important crop in India after wheat and rice. It is considered one of the most productive crops due to its high yield gene potential. It is also a very adaptable crop, adjusting to diverse climatic conditions. It is not only used as food for humans and feed for animals, it also is a very crucial raw material for products like pharmaceuticals, alcoholic beverages, gum and packaging. As per the data by NSSO, in India, the state the maximum area under high yielding variety of maize is Karnataka with an area of 1013 thousand hectares. The states which have seen a progress in the area under HYV are Karnataka, Orissa and Rajasthan. Negative growth has been observed in very few states like Jammu and Kashmir.

**Table 9.7 Area of High Yielding Variety of Jowar**

('000 hectare)									
State	Season	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
1	2	3	4	5	6	7	8	9	10
Andhra Pradesh	Kharif	-	-	-	-	-	-	-	2
	Rabi	-	-	-	-	-	-	-	26
Chhattisgarh		-	-	-	-	-	-	-	-
Gujarat	Kharif	40	53	41	55	31	50	-	40
	Summer	8	7	4	38	18	29	15	-
	Rabi	-	-	-	-	-	-	-	12
Karnataka	Kharif	306	234	245	189	304	262	341	254
	Rabi	400	677	856	848	830	800	775	819
	Summer	6	6	-	-	16	-	-	6
Madhya Pradesh		-	-	-	-	-	-	-	-
Maharashtra	Kharif	-	1717	1677	1570	1518	-	1378	1253
	Rabi	-	-	-	-	-	-	-	-
Rajasthan		147	131	117	292	174	218	171	51
Tamil Nadu		-	-	-	-	-	-	-	-
Uttar Pradesh		-	-	-	-	-	-	-	-
Blank (-) Not available with State Agricultural Statistics Authority (SASA)									
Source: Consolidated results of Crop Estimation Survey on Principal Crops- Published by NSSO									

## NOTES

### Area under HYV of Jowar

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Another popular feed and fodder crop is jowar. It is very popular in agriculture for its adaptability as it grows in both rabi and kharif season. It is also quite similar to maize in terms of nutritional value and thereby posing as a competitor in livestock feed category.

As per the NSSO data, the area under HYV of jowar is Maharashtra. The best performing state in terms of increase in the area under the production of hybrid jowar is Karnataka in the rabi season, where the area under HYV jowar was 400 thousand hectares in 2000-01 as opposed to 819 thousand hectares of 2007-08. There has been major decline in the area under HYV jowar in states like Maharashtra which has seen a drop from 1717 thousand hectares in 2001-02 to 1253 thousand hectares in 2007-08 and Rajasthan which has seen a contraction of area from 147 thousand hectares in 2000-01 to 51 thousand hectares in 2007-08.

### NOTES

#### Check Your Progress

14. Name the new variety of grape in the peninsular and Deccan India.
15. Name the main varieties of rice suitable for general cultivation.
16. What was the purpose for the establishment of the National Seeds Organization?

## 9.6 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Agriculture was the sector of the economy which was given high priority in the First Five-Year Plan.
2. The main objective of the New Agricultural Strategy was to hinge upon the use of High Yield Variety seeds.
3. The thrust of the Intensive Agricultural District Programme was to accelerate the pace of growth through judicious use of inputs, man-power and financial resources in some select districts.
4. In the Fifth Plan, training facilities were extended, official plant protection facilities were expanded, and an Agricultural Air Service was introduced for aerial spray of pesticides.
5. The term 'Green' in Green Revolution refers to 'crops' while 'Revolution' refers to 'spurt', together implying spurt in crop production.
6. In a labour-abundant country like India, mechanization is generally of a complementary nature.

## NOTES

7. The application of mechanization is restricted in most of the underdeveloped countries as they lack trained personnel to handle these machines.
8. Examples of farm machine techniques which makes agronomic practices more efficient are the seed-cum-fertilizer planter and aerial spraying of fertilizers.
9. In the areas of rugged topography, mechanization helps in levelling the lands and making them suitable for cultivation purposes.
10. The direct benefits of canal irrigation includes greater utilization of land; enlargement of the average size of the farm; generation of demand for additional farm labour; shift in new and better varieties of crops increasing the additional productive investment in farm business, favourable input-output ratio, widening of the scope for increase in land revenue and other local receipts.
11. The protective aspect of irrigation means make up for the moisture deficiency in soils during the cropping season so as to ensure proper and sustained growth of the crops grown.
12. The systems of irrigation developed in different parts of the country is governed by local, meteorological, geological and other physical conditions.
13. Experimental studies undertaken by Shri A.P. Bhattacharya, have given convincing proof that over irrigation is harmful from the point of view of lowering of yields as the unused water not consumed by the plant brings down plant nutrients, while percolating to the ground water table, which keeps on being augmented ultimately leading to water logging which in its turn brings malaria along with complete loss of fertility.
14. Anab-e-Shahi is the new variety of grape in the peninsular and Deccan India.
15. The main varieties of rice suitable for general cultivation are IR-8, Jaya and Jivaya.
16. The purpose with which the National Seed Organization was established was to produce, stock and supply foundation seeds for hybrids particularly hybrid maize which were released by that year (1963).

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## 9.7 SUMMARY

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- On the eve of independence, Indian agriculture was backward, stagnant and almost non-vibrant. The productivity was low, no inducement for investment, with most of the fertile lands now in Pakistan.
- After independence, agriculture was accorded high priority in the Five Year Plans. However, during the initial years of planning, not much headway was made; we had to depend on imports to cope with our need for foodgrains.



- On recommendations of the Ford Foundation Team, the government of India adopted a new approach for the development of agriculture, popularly known as the New Agricultural Strategy. It sought to increase agricultural production through higher levels of productivity.
- The thrust of the Intensive Agricultural District Programme was to accelerate the pace of growth through judicious use of inputs, man-power and financial resources in some select districts.
- Under this IADP, development plans relating to agriculture were to be started in some select districts, rather than across all parts of the rural economy. The thrust of the programme was to accelerate the pace of growth through judicious use of inputs, man-power and financial resources in some select districts.
- Intensive Agricultural Area Programme was launched in 1964-65 across 117 districts of different states in the country. The programme focused on raising the farm productivity through intensive cultivation of some principal crops in the country.
- Input package of new agricultural strategy included: (1) judicious use of manure, (2) High Yielding Variety Seeds, (3) high degree of plant protection, (4) mechanized means of farming, (5) stable irrigation, (6) soil improvement, and (7) improved techniques of farm management.
- The term 'Green' in Green Revolution refers to 'crops' while 'Revolution' refers to 'spurt', together implying spurt in crop production. It started happening in India in 1967-68. In the year 1967-68 itself, foodgrain production increased by nearly 25 per cent. So much increase in foodgrain production in one year (in a country which earlier used to import foodgrains and now has become self-sufficient) implied a revolutionary change.
- Farm mechanisation refers to the use of mechanical power in farm operations. It may be defined as the process of performing certain agricultural operations, which are usually done either by animals or men or by both, with the help of suitable machines.
- Mechanization in agriculture may be of competing nature or of complementary nature to human labour depending upon the circumstances under which it is resorted to. Mechanization may also either be complete or partial based on the work performed by the machines.
- Benefits of mechanization affects farm productivity, labour productivity, costs and social structure.
- But the negative aspects include unemployment, inconsideration for small farms and the lack of skilled workers
- The promotion of farm mechanization in developing countries is neither a pure agricultural production, nor a pure agricultural technology function. Effective mechanization policies require a complete adjustment of the whole agricultural production structure.

## NOTES

## NOTES

- Large-scale mechanization in India would lead to displacement of agricultural labourers and thus it would further aggravate rather than solving our unemployment problem. As agricultural labour is quite cheap in India, the use of labour-saving devices is rather not desirable.
- Absolute non-introduction of mechanization in Indian agriculture would made it highly backward, whereas large-scale mechanization cannot be adopted due to the circumstances prevailing in the country. What is needed is mechanization in those farm operations, where manual methods are insufficient and expensive.
- The need for irrigation arises in India due to uneven rainfall, need for crop production in semi-arid and arid areas, growing population, uneven water supply from rivers, low ground water reserve etc.
- Water is more valuable than land because when water is applied to land, it increases its productivity at least six fold and renders great extents of land productive which otherwise would produce nothing or next to nothing
- The service provided by irrigation may be viewed from two angles viz. (a) protective aspect and (b) additional land use aspect.
- Demerits of irrigation includes excess salt in top layers, over-use of water, leaching and water logging.
- The introduction of a better variety in an agricultural area means an immediate profit for the agriculturist. It improves the crop either in quantity or in quality while scarcely increasing the cost of cultivation.
- The different techniques of obtaining High Yield Variety seeds include thick sowing, fertilizer dosages, pest and disease control and proper timing of fertilizers and irrigation.
- This corporation was established in 1963 mainly as an organization to produce, stock and supply foundation seeds for hybrids particularly hybrid maize which were released by that year. The Corporation launched a major programme of seed production of certified seeds of hybrid maize, hybrid jowar. hybrid bajra and Taichung Native I in December 1965 and January 1966.
- High yielding varieties of seeds are the core of our agricultural progress. They are considered as 'miracle seeds'. Within a short period, the area placed under High Yielding Varieties of seeds had increased considerably.

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## 9.8 KEY WORDS

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- **Shifting cultivation:** In this kind of practice, cultivation is done at one place for some years and thereafter it is shifted to another place. The farmers clear a piece of land by burning the jungle. They cultivate it for two or three

years. When this piece of land is infested with weeds, they abandon it and clear another piece by burning the jungle.

- **Mechanization of Agriculture:** Mechanization implies the use of machines, like, tractor, harvester and thresher, (instead of man power or cattle power) in farming.
- **OPEC countries:** This abbreviation refers to the Organization of the Petroleum Exporting Countries who have an agreement to control the amount of oil that each country can produce and sell:
- **Rabi:** It is the agricultural season in which rain is scarce and only irrigated crops are grown, with crops sown in October and November and harvested from March to May.

## NOTES

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## 9.9 SELF ASSESSMENT QUESTIONS AND EXERCISES

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### Short Answer Questions

1. What were the achievements of the IADP programme?
2. List the benefits of Farm Mechanization.
3. What are the remedies suggested to prevent the salt effervescence of water?
4. Write short notes on irrigation and HYV seeds.

### Long Answer Questions

1. Discuss the input package of the New Agricultural Policy.
2. Do you agree with the view that the Green Revolution has had only limited impact on Indian agriculture? Give reasons for your answers.
3. What is the Green Revolution? Discuss its impact on productivity and distribution of income in Indian agriculture.
4. What do you understand by mechanization of agriculture? Discuss its possibilities and limitations in India.
5. What are the demerits of mechanization in Indian agriculture?

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## 9.10 FURTHER READINGS

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## NOTES

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## UNIT 10 SMALL FARMERS AND AGRICULTURAL LABOUR

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*Small Farmers and  
Agricultural Labour*

### NOTES

#### Structure

- 10.0 Introduction
- 10.1 Objectives
- 10.2 Meaning and Characteristics Agricultural Labour
  - 10.2.1 Types of Agricultural Labour
  - 10.2.2 Agricultural Unemployment
  - 10.2.3 Characteristics and Problems of Agricultural Labour in India
  - 10.2.4 Trends of Agricultural Labour in India
  - 10.2.5 Measures to Improve Conditions of Agricultural Labourers
- 10.3 State Policy Towards Agricultural Labour
- 10.4 Answers to Check Your Progress Questions
- 10.5 Summary
- 10.6 Key Words
- 10.7 Self Assessment Questions and Exercises
- 10.8 Further Readings

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### 10.0 INTRODUCTION

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One of the most disquieting features of the rural economy of India has been the growth in the number of agricultural workers-cultivators and agricultural labourers engaged in the crop production. The phenomena of under employment, under-development and surplus population are all simultaneously manifested in the daily lives and livings of the agricultural labourers. They get unusually low wages, conditions put an excessive burden on them and the employment which they get is extremely irregular.

The nature of unemployment in India is very different from the nature of unemployment in industrially advanced countries. It is well-known that unemployment is found in its severest form in rural India. Rural unemployment may broadly be classified into two categories namely: seasonal unemployment and disguised unemployment.

Agricultural labour is a seasonal occupation and there is always a heavy demand and for labour at the time of sowing, weeding and harvesting, where as in the slack season, demand for labour falls considerably. The period or seasonal unemployment in India varies from state to state, depending upon the methods of farming, nature of soil and possibility of multiple cropping. Agricultural labour in India remains ideal from four to six month in a year.

On the other hand, disguised unemployment in rural India is prevalent among marginal and small farmers. Their land resources are not enough to provide full employment throughout the year to all members of their family. There are some

important steps initiated by the government to improve the plight of agricultural labourers. In this unit, you will learn about the concept of agricultural labour, understand its various types, and assess the state policy for agricultural labour.

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### 10.1 OBJECTIVES

After going through this unit, you will be able to:

- Describe the meaning, types and characteristics of agricultural labour
- Understand the concept of disguised and seasonal unemployment
- Explain the income and labour wages in India
- Mention the state policy for agricultural labour

### 10.2 MEANING AND CHARACTERISTICS OF AGRICULTURAL LABOUR

It is rather difficult to define the term ‘agricultural labour’ in precise terms. However, it will be useful to refer to some of the attempts made by experts in this connection. The first Agricultural Labour Enquiry Committee (1950-51) defined this as ‘those people who are engaged in raising crops on payment of wages.’ The second Agricultural Labour Enquiry Committee (1956-57) enlarged the definition of agricultural labour to include those who are engaged in other agricultural occupations like dairy farming, horticulture, raising of livestock, bees, poultry etc.’

According to the National Commission on Labour, ‘an agricultural labourer is one who is basically unskilled and unorganised and has little for its livelihood other than personal labour.’ Thus, persons whose main source of income is wage employment fall in this category. It consists of two sub-categories:

- i. landless agricultural labour and ii. very small cultivators whose main source of earnings, due to their small and sub-marginal holdings, is wage employment. Landless labour in turn can be classified into two broad categories: (a) permanent labour attached to a cultivating household, and (b) casual labour. The second ground can again be sub-divided into three sub-groups: cultivators, sharecroppers, and lease holders.

Permanent or attached labourers generally work on annual or seasonal basis and they work on some sort of contract. Their wage share is determined by custom or tradition. On the other hand, temporary or casual labourers are engaged only during break period for work. Their employment is temporary and they are paid at the market rate. They not attached to any landlord.

In India, **agricultural labour** refers to physical work done on the fields and farms of others. Agricultural labour is basically unskilled and makes his living

by the way of compensation of labour in cash or kind. It is largely during the sowing and harvesting seasons that there is an intense demand for labour. Accordingly, it is during these seasons that the workers find employment to generate income for the subsistence of their families for the entire year. Instinct to survive blended with a struggle to survive characterizes the way of life of the labourers in Indian agriculture.

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### 10.2.1 Types of Agricultural Labour

Agricultural labour in India is broadly classified into two categories, viz., (A) Landless labourers including independent landless labourers and bonded landless labourers. (B) Small and marginal farmers as agricultural labourers. It includes small and marginal farmers with or without economic holdings. This is how we can describe these categories:

#### (A) Landless Labourers

These are those people who themselves are landless, and are therefore, exclusively dependent upon the lands of others for their livelihood. Landless labourers are further categorized as:

- (i) Independent landless labourers, and
- (ii) Bonded landless labourers

Independent landless labourers have the freedom to move from one farm to the other and bargain for the wage rate commensurate with the supply-demand status in the labour market. Bonded landless labourers are tied to their master with no freedom to move from one master to the other. They are almost like slaves, dependent of their masters for their economic and social security. Though, bonded labour has been abolished in India by law, yet many examples of it can be found in the rural areas.

#### (B) Small and Marginal Farmers as Agricultural Labourers

India is a land of small and marginal farmers. Farming hinges upon subsistence needs of the farming families. However, most of the small and marginal holders fail to earn enough from their tiny holdings. Often, they are to work on others' land to supplement their earning. So, the small and marginal holders work as agricultural labourers as well, small and marginal farmers as agricultural labourers are further divided into two categories, viz.

- (i) Small and marginal farmers without economic holdings, working as agricultural labourers, and
- (ii) Small and marginal farmers with economic holdings, working as agricultural labourers.

In case of small and marginal farmers (also called as small and marginal holders) without economic holdings (holdings which are economically not viable

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for cultivation), it is economic compulsion that forces them to work as agricultural labourers. But in case of small and marginal holders with economic holdings, it is basically the idea of supplementing family income that some members of the family work as agricultural labourers. Those who work on the farms of others, obviously do not find gainful employment on their own farms.

### 10.2.2 Agricultural Unemployment

Not all those who are engaged in the agricultural labour are involved in a productive capacity. In agricultural labour, there are chances of unemployment. We will have a look at the two most prominent types here.

#### Disguised Unemployment

In India, approximately, 25 per cent to 30 per cent of the population working in the rural areas suffers from disguised unemployment. **Disguised unemployment** is a situation wherein the number of workers engaged in a job is much more than actually required to accomplish it. If some of them are withdrawn from that job, the total production will not fall. For example, if just two persons are required to cultivate a farm measuring one hectare, but actually five persons are engaged there, then three persons are disguisedly unemployed. They are superfluous and not needed. On account of joint family system in India, small size of holdings and lack of alternative avenues of employment, all members of the farmer's family keep themselves occupied with the cultivation of the family farm.

Thus, apparently all members appear to be employed whereas in reality they are not contributing anything to total production. If some members are withdrawn, total production of the family farm will remain unchanged. That is why they are called disguisedly unemployed. In India, the problem of disguised unemployment is indeed a serious problem.

#### Seasonal Unemployment

Another kind of rural unemployment is seasonal unemployment. It occurs simply because agriculture is a seasonal occupation. Crops are grown according to their respective seasons. During off-season, usually the farm workers are rendered idle. They have no work to do. The volume of seasonal unemployment depends upon the conditions and methods of cultivation in different states. It is estimated that a farmer who grows one crop in a year usually remains unemployed for five to seven months.

In rural areas, besides agriculture, there are many other seasonal activities like sugarcane crushing, brick-kilns, etc. Workers engaged in these activities remain occupied for a few months in a year. For rest of the period, they remain unemployed.



### 10.2.3 Characteristics and Problems of Agricultural Labour in India

Following are the principal characteristics of agricultural labour in India:

- (i) **Unorganised:** Agricultural labourers in India are totally unorganised with no trade unions whatsoever. It is because of this that they fail to bargain for a high wage rate and better working condition. Often they are at the mercy of their masters/employers.
- (ii) **Low Wage:** Low wage rate is perhaps the central feature of agricultural labour in India. In backward regions, wage rate is miserably low. The economics of it is that the supply of agricultural labour is abundant compared to its demand. It is also because agricultural labourers are an absolutely unorganized class of workers. Some labourers are working as bonded labourers with their masters in exchange for the security of their survival.
- (iii) **Low Social Status:** By and large, agricultural labourers in India belong to low castes: 'Dalits', 'tribes' or the 'backward classes'. So, they suffer deprivation not only economically but socially as well. Because of their low socio-economic status, agricultural labourers are living as oppressed section of the society. Politically also they fail to raise their voice against the indignity and atrocities that they often suffer.
- (iv) **Unskilled:** Agricultural labourers in India can be characterized as unskilled workers.  
However, through learning they tend to acquire efficiency that makes them suitable for specialized jobs.
- (v) **Migratory and Casual:** Agricultural labour in India is migratory in character. It is due to the fact that their demand peaks up only during sowing and harvesting seasons. During rest of the year, they tend to migrate to urban areas for jobs, largely as domestic help or as workers at the construction sites. Nearly, 85 per cent of agricultural labourers in India are not attached to the land or the landlords. They work only as casual workers and are hired as and when required. This renders them vulnerable to exploitation.
- (vi) **Indebtedness:** Indebtedness characterizes most agricultural labourers in India. It is perpetual and almost a part of their living system.

### 10.2.4 Trends of Agricultural Labour in India

So far as the size of agricultural labour is concerned, there are no accurate estimates. There are divergent reports of various committees and commissions on the number of agricultural labourers, their income and living standard, etc.

The common opinion is that over time, the size of agricultural labour has tended to swell. Census 1881 recorded their number as 75 lakh, census 1951 showed it to be 280 lakh, census 1981 recorded it to be 555 lakh, and census 2001 estimated it to be 1,074 lakh.

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It is amazing that, even as a percentage of total workforce in the country, the size of agricultural labour continues to swell. It was nearly 17 per cent in 1901, and nearly 27 per cent in 2001. To be noted, however, is the fact that between the census 1971 and census 2001, this percentage has tended to stabilize around 26 -27 per cent. As per Census 2011, the population counted as cultivators and agricultural labour increased from 22.62 million to 26.05 million.

### Causes of Growth of Agricultural Labour in India

There are many factors responsible for the alarming growth of agricultural labour in India. Some of the prominent ones are the following:

- (i) **Growth of Population:** A rapid population growth is the principal cause of rapid rise in the size of agricultural labour in India. Since, 1921, the year of 'great divide' in the demographic history of India, population has tended to rise at an explosive rate. Pace of economic growth on the other hand failed to generate adequate employment opportunities in the secondary and tertiary sector. Consequently, additional work force has been compelled to engage itself in agricultural sector.
- (ii) **Lack of Vocational Avenues outside Agriculture:** In India, vocational avenues outside agriculture are lacking. As a result, workforce (which emerges largely in the rural areas) continues to be confined to rural areas, compounding its dependence on agriculture by way of agricultural labour.
- (iii) **Decline of Village Industry:** During the pre-British period, rural economy of India was significantly nurtured by the cottage industry. It moderated the pressure of population on land. But the British period witnessed the decay of cottage industry. It also wiped out opportunities of employment. Accordingly, the bulk of working force had to depend on agriculture as a source of employment. Dependence on agriculture enhanced and it contributed to the expansion of the class of agricultural labourers.
- (iv) **Mobility Constraints:** Mobility of labour in India depends not only on economic factors alone. It is significantly influenced by family as well as social considerations. These considerations have often acted as a constraint in the movement of labour from agriculture to non-agricultural pursuits, except temporarily during off-seasons.
- (v) **Indebtedness of Small and Marginal Holders:** Indebtedness has been the core characteristic of small and marginal holders in India. Pressure of indebtedness has forced many of these holders to sell off their land and join the ranks of landless agricultural labourers.
- (vi) **Oppressive Land-tenorial System during the British Rule:** British rule in India saw an oppressive land-tenorial system. The landlords and zamindars often resorted to large scale eviction of the tenants with a view of enhancing their revenue. Permanent tenants were thus reduced to the status of landless labourers.

- (vii) **Poor Enforcement of Land Reforms after Independence:** Zamindari system— a regressive system of land revenue — was abolished after Independence. Also, ceiling on holdings was introduced and surplus land was redistributed among the small and marginal holders as well as among the landless labourers. But, in most cases, the government failed to sustain the reforms. It was just a matter of time that small and marginal holders as well as the agricultural labourers lost their land after its initial mortgage. Their land was never complemented with any meaningful support system. Land alone is not a sufficient means of production. It ought to be supported with the other means including tools, implements and inputs of seeds water and fertilizer. Initially, a mortgage, and finally a desperate sale of their land was almost an inevitable occurrence, in the absence of any systematic support system.

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### 10.2.5 Measures to Improve Conditions of Agricultural Labourers

To improve the socio-economic conditions of agricultural labourers, following are some general suggestions:

- (i) **Effective Implementation of Minimum Wage Act:** Wage rate for agricultural labour is extremely low in India. Barring few states like Punjab, Kerala, etc., in most states of the country, prevailing wage rate for agricultural labour is almost at its bottom. Despite the Minimum Wages Act of 1948, labourers continue to be hired at subsistence wage rate. This points to a glaring laxity in the enforcement of the law. This laxity ought to be pinned. The state government should ensure that agricultural labourers are paid wages in accordance with the Minimum Wages Act. Also, provisions should be made for the periodic revision of wage structure in sync with price structure.
- (ii) **Development of Agriculture:** As a lasting solution to the problems of agricultural labourers, it is extremely essential that productivity standards are raised in the agricultural sector, and that technology is devised for the spread of multi-cropping system. This will generate remunerative opportunities of employment. Agricultural labourers will get employment along with a reasonable wage structure.
- (iii) **Alternative Employment Opportunities:** The government must focus on generating opportunities of employment outside agriculture. This will facilitate migration of workers from agricultural to non-agricultural areas of employment. Accordingly, the burden of excessive labour force on land would reduce, rural wage rate will rise in parity with urban wage rate. Alternative employment opportunities may be generated through the development of rural village infrastructure and the development of rural industry, particularly the agro-processing industry.

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**(iv) Formation of Peasant Unions:** The bargaining power of the agricultural labourers should be enhanced through the formation of peasant unions. Agricultural labourers can bargain for higher wages, and moderate working hours through their unions. Initiatives should be taken by the government and non-governmental organizations for the formation of such unions.

**(v) Rehabilitation and Settlement:** Agricultural labourers should be provided land and other durable assets so that they become self-employed and generate sufficient income for their living. This can be done if the government effectively enforces the land ceiling law. The surplus, accruing through the implementation of this law, should be distributed to the landless labourers. Inputs (seeds fertilizers and others) can be provided through special schemes sponsored by the government as well as non-government organizations.

**(vi) Social Security:** Like the workers in the industrial and services sector, agricultural labourers should be provided social security. Insurance and pension schemes with moderate premium (or free of charge) should be launched by the government specifically to address the problems of agricultural labourers.

**(vii) Removal of Bonded Labour System and Other Forms of Exploitation:** Even though the term bonded labour is abolished in India (through the abolition of bonded labour system Act, 1976), it continues to be practised in several parts of the country. Examples of bonded labour would multiply from scores to centuries, if one surveys the rural areas identifying people who are tied to their masters in exchange for their economic security (at that subsistence level).

Enforcement of law is way behind the enactment of law on the removal of bonded labour system.

Need of the hour is that the government strictly enforces the law, setting examples of severe punishment to the offenders. Also, other forms of exploitation of agricultural labours (like low wages in kind, long working hours) should be addressed on priority basis.

Summing up, we can state that agricultural labourers in India are a class suffering from a miserable plight. Their number is swelling and their poverty and deprivation are assuming serious dimensions. This is a serious social menace particularly when we claim to be emerging as tenth largest industrialized economy in the world. The government has shown its serious concerns for the problem, initiating several measures to combat it. But, as usual, the government succeeds at plans and programmes, and fails at their implementation.

### Check Your Progress

1. What is agricultural labour?
2. During which time of the agricultural cycle is the demand for labour the most intense?
3. Name the two types of landless labourers.
4. Mention two characteristics of agricultural labour.

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## 10.3 STATE POLICY TOWARDS AGRICULTURAL LABOUR

Government has taken various remedial steps to improve the plight of agricultural labourers. Some of these are; Minimum Wage Act, rural employment programmes, abolition of bonded labour and establishment of national commission on rural labour etc.

The agricultural labourers, particularly the landless ones, belong to backward communities and they suffer from social disabilities and are prone to economic exploitation. Their living levels are low and their earnings are generally on the poverty line, uncertain and meagre for sustenance.

Therefore, the First Plan observed, 'Agricultural labour population are concentrated mostly in areas where population presses heavily on the land and the development in sectors of the economy other than the agricultural has been retarded. By selecting such areas for special programmes—such as C.D.P.-it should be possible to make a distinct contribution to the problem of rehabilitating agricultural labourers, for an increase in the tempo of development is the effective answer to the problem of unemployment and underemployment.'

### Special Programmes for Agricultural Labourers

India's rural working population consists mainly of small farmers and landless agricultural labourers. The problems of the small farmers and the agricultural labourers vary from area to area but the more common problems being fragmented and small holdings, insecurity of tenure, inadequate and untimely supply of agricultural inputs, lack of adequate credit facilities and marketing facilities. All of these have immensely hindered the development of agriculture on a sound basis and also stood in the way of improving the economic and social conditions of these people. Therefore, with a view to enable the weaker sections of the rural population to take advantage of the benefit of economic growth in the rural areas through spread of new technology certain well-defined programmes were launched during the Fourth Plan period, particularly to increase employment opportunities and the productive potential of the economically weak farmers and landless agricultural labourers.

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Before learning about some recent schemes, let's discuss some landmark schemes.

### **Small Farmers' Development Agencies and Marginal Farmers and Agricultural Labourers (SFDA & MFAL)**

The All-India Rural Credit Review Committee (1969), while considering the problem of small holdings, came to the conclusion that by proper state support and appropriate institutional changes, it would be possible to tackle effectively the problems of what it called 'potentially viable farmers'. These farmers were small farmers whose agricultural business could be rendered viable if there was support in terms of irrigation, supplies of inputs and services at fair prices, etc. It, therefore, recommended institutional setup in the form of Small Farmers Development Agency and suggested measures for expanding the flow of institutional credit and other state assistance to the small farmers in an integrated effect to raise their economy to surplus level.

Accordingly, the Planning Commission initiated during the Fourth Five Year Plan, two schemes of the nature of pilot projects in the Central Sector of the Plan was recommended. One was the scheme for Small Farmers' Development Agencies (SFDA) and the other for Marginal Farmers and Agricultural Labourers (MFAL). The SFDA Projects were to be kept distinct from MFAL Projects, because the accent on programmes in these two projects differed. But it was realized that their areas of operation might coincide in certain cases. Therefore, it was contemplated that it might be possible to use the SFDA as the instrument for executing the MFAL scheme. The scheme was started in 1971-72 and was merged with Integrated Rural Development Programme (IRDP) itself was merged with other programmes into Swarnajayanti Gram Swarozgar Yojana. The SGSY was first renamed as National Rural Livelihood Mission in 2011 and then merged into Deen Dayal Upadhyaya Antyodaya Yojana.

For the purposes of these programmes, a small farmer is defined as one having a land holding of 2.5 to 5 acres and the marginal farmer below 2.5 acres of dry land. In the case of irrigated lands, the limits of land holding are generally 50 per cent of those indicated above. The landless agricultural labour is taken as one who does not have any land holding but has a permanent homestead and derives more than half of his income from agricultural pursuits.

The functions of the agencies are to identify the participants according to the norms laid down by the Government of India, draw up suitable programmes for improved agriculture and subsidiary occupations, arrange credit through institutional source and get the programmes executed through the existing development and extension agencies in the project area.

The agencies' main thrust in the project area is on crop husbandry. Programmes of subsidiary occupations are also taken up depending upon the

suitability of marketing facilities. The programme for improved agriculture includes land development, soil conservation, minor irrigation, horticulture, demonstrations, introduction of new and improved, varieties, adoption of multiple cropping pattern etc. Considerable stress is laid on the adoption of dry land farming techniques and water harnessing measures in rainfed areas. The subsidiary occupations include supply of milk animals, poultry, piggery, sheep and goat rearing and fisheries.

The identified small farmers are allowed subsidies up to 25 per cent and marginal farmers and agricultural labourers up to 33.3 per cent of the investment cost for various programmes. A ceiling of ₹3,000 has been laid down for such subsidy from the project funds to an individual participant during the entire project period. In case of group community projects like community irrigation works, subsidy up to 50 per cent is allowed from the project fund. The following observations would point out the results of these projects:

‘We have sufficient evidence to prove that proper attention has not been given to the problem of identification of small farmers. It is our impression that the SFDA programme is treated as a programme of extended benefits and farmers try to make suitable adjustments to pocket these benefits. The result is that all the benefits extended under the scheme have not gone to the small farmers and leakages. The real effectiveness of the programme have been found to be not less than 30 per cent’

Another study, conducted in MFAL districts, has indicated that while the programme was intended to be limited to only marginal farmers, out of forty-eight participant households selected for the study, six have lands between twenty-eight and four hectares. These features are disturbing. If the programme for small and marginal farmers has to be truly a programme for removal of their poverty, it is necessary to be vigilant and selective and to direct state assistance to those who deserve it the most. The dilution of the programme through leakages cannot be allowed. In view of these findings the National Commissions on Labour has suggested that:

- (i) For the purpose of the programme, the maximum limit of holdings of small farmers should be not above 2 hectares and of marginal farmers not above 1 hectare.
- (ii) The coverage of small and marginal farmers in the combined project areas should preferably be in the ratio of 1: 3 on an average (as against three at present) to ensure that the programme has the necessary tilt in favour of marginal farmers.
- (iii) 70,000 farmers (17,500 small and 52,500 marginal) should be covered in an area under an agency, and there should be one agency for one district.
- (iv) The programme should be extended during the Five Year Plan to 160 units covering 11 million families.

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- (v) It would be appropriate and reasonable to distribute the additional agency units on the basis of the state-wise distribution of the number of small and marginal farmers and agricultural labourers.
- (vi) In extending the programme, emphasis should be on the selection of areas having fairly assured rainfall. The programme need not be extended to drought affected areas in which a separate programme has been taken up.
- (vii) Individual subsidiary programmes such as milk production, poultry raising, sheep rearing and pig production should be superimposed as separate programmes in these combined programmes district which coincide with those for the special subsidiary programmes.
- (viii) The combined programme agencies should be in close touch with the special subsidiary programmes and be responsible for identifying the beneficiaries amongst the small and marginal farmers and agricultural labourers for these programmes.
- (ix) The entire programme should be time bound and target oriented and should be implemented with a sense of urgency.
- (x) The extension machinery in the districts should be strengthened and oriented to pay particular attention to the problems of small and marginal farmers.
- (xi) As many Farmers' Service Societies as possible should be established in the project areas to ensure the provision of credit, service, supply and marketing facilities and also technical advice at one place.

### Crash Scheme for Rural Development

The Crash Scheme for Rural Development (CSR D) was sponsored by the, Central Government and Implemented through the agency of State Governments, in April 1971 for a period of the three years. The primary objectives of the scheme were:

- (i) The direct generation of employment for 1,000 persons on an average, continuously over a working season of ten months in a year in all rural districts of the country through the execution of projects which are essentially labour intensive.
- (ii) The production of assets or works of a durable nature in consonance with local development plans so that all-round development of the districts is assisted.

The labour intensive works to be largely taken up under this scheme related to land development and reclamation, road building drainage, minor irrigation, water conservation and ground water recharging, soil conservation, afforestation and special repairs. For implementation of these objectives, special directions were issued to the State Governments for selections of the projects workers and allocation of funds.

Initially ₹50 crore were allocated in 197-72 but in 1972-73 ₹48.4 crore and in 1973-74 ₹47.5 crore were provided. This reduction was due to the taking up of



a special project entitled 'Pilot of Intensive Rural Employment Project' (PIREP) with an allocation of ₹1.5 crore for 1972-73 and ₹2.5 crore for 1973-74. During the three years 1971-74, total cost of various schemes totalled ₹156.6 crores of which about 79 per cent was on construction of roads and 10 per cent on minor irrigation works. The evaluation for the working of the scheme brings out the following conclusions:

- (i) The daily wage rates in these projects were perceptibly lower than the normal wage rates.
- (ii) The coverage of working force was uneven and disproportionate with reference to proportionate labour force in the states.
- (iii) The projects did not bring out diversification or transformation of rural labour towards other sectors of the economy.
- (iv) The projects were mostly of absorptive nature i.e. they could not create perennial potentialities of employment for as soon as they were completed they threw the workers out of employment.
- (v) The project did not lay the foundations for the industrialization of the rural economy, which is imperative for creating continuous job opportunities.

### **Integrated Land Distribution Programme**

An integrated land distribution programme was chalked out and implemented by the Planning Commission during the third and subsequent plans. The objective has been to remove the disabilities of small farmers and the poverty of the landless agricultural labour by redistributing the land, available from reclamations and acquisition as surplus land over the ceiling on the holding of land. The scheme tried to modify the strategy of rural development 'to improve the absorptive capacities and productive capabilities of millions of small farmers'. For distribution of land the policy adopted is:

- (a) No household ownership holding will be larger than 8 hectares in wet lands and 10 hectares in dry lands.
- (b) Non-land owning and non-cultivating households will not be given agricultural land released for redistribution.
- (c) The lands released through fixing a ceiling on holding is to be given to the households which have less than 2 hectares.

With such a land distribution policy, it was envisaged that the difference in per capita land ownership between the smallest and the largest household holdings may be more than five times. Besides, the proportion of people below the poverty line would be reduced from two-fifths to about one-third.

In almost all states, rules have been framed to give priority to landless labourers particularly to those belonging to the Scheduled Castes and Scheduled Tribes in the allotment of government and fallow lands. Under IRDP, all families in rural areas living below the poverty line are eligible for assistance. There is reservation

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for SC/ST up to 50 per cent of total families assisted. It was estimated that 20 million families would be assisted under IRDP during the Seventh Plan. IRDP has been extended in all community development blocks of the country. In addition to this, lakhs of hectares were distributed among landless labourers out of the land that became surplus as a result of the implementation of ceiling laws.

As mentioned earlier, the IRDP was merged to form Swarnajayanti Swarozgar Yojana in 1999, it was renamed National Rural Livelihood Mission in 2011 and later merged to form the Deen Dayal Upadhyaya-Antyodaya Yojana.

### **National Rural Employment Programme**

The NREP was launched in October 1980 and became a regular programme from April, 1981. The programme was expected to generate additional gainful employment in the rural areas, to the extent of 300-400 million man-days per annum. NREP programme was expected to create durable community assets and improve nutritional status and living standard of the poor. The creation of durable assets is an important objective of this programme. Under the National Rural Employment Programme 1775.5 million mandays employment was created. Durable assets were created through social forestry, soil conservation, construction of roads and tanks. Additional irrigation potential was also created under the programme. The NREP was converted in Jawahar Rozgaar Yojana in 1989.

### **Rural Landless Employment Guarantee Programme**

RLEGPW was introduced from 15 August 1983 with the objective of (a) improving and expanding employment for the rural landless with a view to provide guaranteed employment to at least one member of every landless household for some days in a year and (b) creating durable assets for strengthening infrastructure so as to meet the growing requirements of the economy. The target of employment creation in 1983-84 was fixed at 360 million man-days against which 260 days of employment was actually created.

This programme is expected to have resulted in the creation of a large number of durable community assets and economic infrastructure in the rural areas. An outlay of ₹743.78 crore was provided in the central sector for the Seventh Five Year Plan for this programme with the target of generating 1013 million man-days of employment during the plan period. The scheme was merged with Jawahar Rozgaar Yojana in 1989.

### **Jawahar Rojgar Yojna**

Jawahar Rojgar Yojna was launched in 1988-89 to create employment opportunities in rural areas. National Rural Employment Programme and Rural Labour Employment Programmes were merged in Jawahar Rojgar Yojana. Thirty per cent of the employment opportunities created under the programme are reserved for ladies belonging to the economically weaker sections of the society.

Since 1993-94, JRY is being implemented in following three streams. The first stream comprises of general works under JRY. The second stream of JRY also called as the intensified JRY is implemented 120 identified backward districts with additional allocation. The third stream of JRY consists of special and innovative projects. Under JRY about 896 million man-days of employment was generated during 1995-96 but the achievement during 1995-96 was lower than the achievements of 1994-95 and 1993-94. There is need to strengthen the Jawahar Rozgar Yojana.

### **Employment Assurance Scheme**

Employment Assurance Scheme was launched on 2 October 1993. The scheme aimed at providing assured employment to all persons in rural areas who are below the poverty line and are seeking employment but are unable to find it. The scheme is being implemented in 3206 community development blocks. A decision has been taken to universalize the scheme. All the community development blocks will be included under the scheme by 1998- 99. About 347 million man-days employment was generated during 1995-96, as against 274 million man-days during 1994-95. The scope of scheme has also been enlarged for taking up horticulture activities on individual beneficiary's land of marginal farmers.

The Jawahar Rozgaar Yojana was merged with Employment Assurance Scheme (EAS) and Jawahar Gram Samridhi Yojana (JGSY) in 2001 to form the Sampoorna Grameen Rozgar Yojana. This was merged to form the National Rural Employment Guarantee Scheme in 2005/08 under the MGNREGA.

### **Abolition of Bonded Labour**

Ever since Independence there has been no difference of opinion on the need to abolish the system. Article 23 (1), forming part of the chapter on Fundamental Rights in the Constitution lays down: 'Traffic in human beings and beggars and other similar forms of forced labour are prohibited and any contravention of this provision shall be an offence punishable in accordance with law.' Convention 29 of the International Labour Organisation (ILO), to which India is a party, said that 'forced or compulsory labour' could not be permissible. Section 374 of the Indian Penal Code has declared any form of forced labour as an offence. In 1961, the Dhebar Commission emphasized that a special legislation should be adopted to abolish bonded labour, to which repeated attention had been drawn by the Commissioner for Scheduled Castes and Scheduled Tribes.

The practice was formally abolished on 25 October 1975 when a notification was issued for the purpose by the Union Government saying that 'No person shall make any advance under the system or compel any person or render any bonded labour or other form of forced labour. Any custom or tradition or any contract by any member of the family or dependent of such person, who is required to do any work or render any services as bonded labour shall be void and inoperative. No

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person, who has been freed and discharged under this ordinance, shall be evicted from any homestead or other residential premises which he has been occupying.

All property vested in a bonded labourer under any mortgage, charge, lien or other incumbrances in connection with any bonded debt stand freed and be restored to the possession of the bonded labourer. If any delay is made in restoring any property, such labourer is entitled to recover from the mortgagee, charge or incumbrance as may be determined by the civil court.'

Liability to repay bonded debt, according to the ordinance, stands extinguished. Every obligation of a bonded labourer to repay any bonded debt or such part of any bonded debt as remains unsatisfied immediately shall be deemed to have been extinguished. No suit proceeding shall lie in any civil court or before any other authority for recovery of bonded debt or any part thereof.

No creditor shall accept any payment against any bonded debt, which has been extinguished or deemed to have been extinguished or fully satisfied. Any violation of the provisions of the Ordinance shall be a cognizable and bailable offence, punishable with imprisonment which may extend to three years or fine up to ₹ 2,000, or both.

There are several schemes running in the country for agricultural labourers:

- **Soil Health Card Scheme:** Launched in 2015, the Soil Health Cards provide information to farmers on nutrient status of their soil along with recommendation on appropriate dosage of nutrients to be applied for improving soil health and its fertility.
- **Paramparagat Krishi Vikas Yojana (PKVY):** It is being implemented with a view to promote organic farming in the country. This will improve soil health and organic matter content and increase net income of the farmer so as to realise premium prices.
- **Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) :** Launched on 1st July, 2015, it is being implemented to expand cultivated area with assured irrigation, reduce wastage of water and improve water use efficiency.
- **National Agriculture Market (e-NAM):** The National Agriculture Market scheme (e-NAM) envisages initiation of e-marketing platform at national level and to support creation of infrastructure to enable e-marketing in 585 regulated markets across the country by March 2018.
- **Pradhan Mantri Fasal Bima Yojana (PMFBY)/ Restructured Weather Based Crop Insurance Scheme (RWBCIS):** It is to provide comprehensive crop insurance coverage from pre-sowing to post harvest losses against non-preventable natural risks.
- **Interest Subvention Scheme (ISS):** The Government provides interest subvention of 3% on short-term crop loans up to ₹3.00 lakh.

### **Check Your Progress**

5. What are the most common problems of small farmers and agricultural labourers in India?
6. Who are potentially viable farmers?
7. What were the labour intensive works to be taken under the Crash Scheme for Rural Development?
8. What was the objective of the Integrated Land Distribution and Drought prone programme?
9. Mention the three streams in which JRY is being implemented?

### **NOTES**

## **10.4 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS**

1. Agricultural labour refers to physical works done on the field and farms of others with wages in cash, kind or both.
2. There is an intense demand for labour largely during the sowing and harvesting seasons of the agricultural cycle.
3. The two types of landless labourers are independent landless labourers and bonded landless labourers.
4. Two characteristics of agricultural labour (i) Low bargaining power (ii) Low social status.
5. The most common problems of the small farmers and the agricultural labourers vary from area to area but the more common problems are fragmented and small holdings, insecurity of tenure, inadequate and untimely supply of agricultural inputs, lack of adequate credit facilities and marketing facilities.
6. Potentially viable farmers are those farmers whose agricultural business could be rendered viable if there was support in terms of irrigation, supplies of inputs and services at fair prices, etc.
7. The labour intensive works to be largely taken up under the Crash Scheme for Rural Development related to land development and reclamation, road building drainage, minor irrigation, water conservation and ground water recharging. soil conservation afforestation and special repairs.
8. The objective of the Integrated Land Distribution and Drought prone programme has been to remove the disabilities of small farmers and the poverty of the landless agricultural labour by redistributing the land, available from reclamations and acquisition as surplus land over the ceiling on the holding of land.

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9. JRY is being implemented in following three streams. The first stream comprises of general works under JRY. The second stream of JRY also called as the intensified JRY is implemented 120 identified backward districts with additional allocation. The third stream of JRY consists of special and innovative projects.

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### 10.5 SUMMARY

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- In India, agricultural labour refers to physical work done on the fields and farms of others. Agricultural labour is basically unskilled and makes his living by the way of compensation of labour in cash or kind.
- Agricultural labour in India is broadly classified into two categories, viz., (A) Landless labourers including independent landless labourers and bonded landless labourers. (B) Small and marginal farmers as agricultural labourers.
- The principle characteristics of agricultural labour: unorganised, low wage, low social status, lack of skills, migratory and indebtedness.
- It is amazing that, even as a percentage of total work force in the country, the size of agricultural labour continues to swell. It was nearly 17 per cent in 1901, and nearly 27 per cent in 2001. To be noted, however, is the fact that between the census 1971 and census 2001, this percentage has tended to stabilise around 26 -27 per cent.
- The causes of growth of agricultural labour in India includes many factors like growth of population, lack of vocational skills outside agriculture, decline of village industry, mobility constraints, indebtedness, oppressive tenurial system, poor enforcement of land reforms.
- Disguised unemployment is a situation wherein the number of workers engaged in a job is much more than actually required to accomplish it. If some of them are withdrawn from that job, the total production will not fall.
- Seasonal unemployment occurs simply because agriculture is a seasonal occupation.
- Crops are grown according to their respective seasons. During off-season, usually the farm workers are rendered idle. They have no work to do.
- Agricultural labourers are a class extremely poor. Their wages are much lower than the industrial labour. But now the Central Government has fixed minimum wages in certain agricultural demonstration farms, research institutes and military farms under its control.
- With a view to enable the weaker sections of the rural population to take advantage of the benefit of economic growth in the rural areas through spread of new technology certain well-defined programmes were launched during

the Fourth Plan period, particularly to increase employment opportunities and the productive potential of the economically weak farmers and landless agricultural labourers.

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- Small Farmers' Development Agencies and Marginal Farmers and Agricultural Labourers (SFDA & MFAL): The functions of the agencies are to identify the participants according to the norms laid down by the Government of India, draw up suitable, arrange credit and get the programmes executed through the existing development and extension agencies in the project area.
- Crash Scheme for Rural Development: The primary, objectives of the scheme were: (i) The direct generation of employment for 1,000 persons on an average, continuously over a working season of ten months in a year in all rural districts of the country and (ii) the production of assets or works of a durable nature in consonance with local development plans
- Integrated Land Distribution Programme was chalked out and implemented by the Planning Commission during the third and subsequent plans. The objective has been to remove the disabilities of small farmers and the poverty of the landless agricultural labour by redistributing the land, available from reclamations and acquisition as surplus land over the ceiling on the holding of land.
- NREP programme was expected to create durable community assets and improve nutritional status and living standard of the poor. The creation of durable assets is an important objective of this programme.
- RLEGPW was introduced with the objective of (a) improving and expanding employment for the rural landless with a view to provide guaranteed employment to at least one member of every landless household for some days in a year and (b) creating durable assets for strengthening infrastructure so as to meet the growing requirements of the economy.
- Section 374 of the Indian Penal Code has declared any form of forced labour as an offence. Convention 29 of the International Labour Organisation (ILO), to which India is a party, said that 'forced or compulsory labour' could not be permissible.
- Jawahar Rojgar Yojana was launched in the last year of the Seventh Five Year Plan. The primary objective of the programme is generation of employment on productive works.
- Employment Assurance Scheme is implemented in 1778 backward blocks in the country. It aims at providing 100 days of unskilled manual work up to two members of the family.

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### 10.6 KEY WORDS

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- **Landless labourers:** These are those people who themselves are landless, and are therefore, exclusively dependent upon the lands of others for their livelihood.
- **Employment Assurance Scheme:** This scheme was launched on 2 October 1993. The scheme aimed at providing assured employment to all persons in rural areas who are below the poverty line and are seeking employment but are unable to find it.
- **Bonded labour:** The term 'bonded labour' has been defined by the National Commission on Labour as 'labour which remains in bondage for a specific period for the debt incurred'.

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### 10.7 SELF ASSESSMENT QUESTIONS AND EXERCISES

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#### Short-Answer Questions

1. Write a short note on disguised unemployment.
2. Briefly discuss income and labour wages.
3. List the main problems of agricultural labourers in India. What measures will you suggest to solve them?
4. What are the problems of agricultural labour in India?

#### Long-Answer Questions

1. What are the main problems faced by the agricultural labour in India? What steps have recently been taken to improve their condition?
2. What are the types of agricultural labour in India? State their characteristics.
3. How do you identify agricultural labourers in India? What are their major problems?
4. What accounts for the huge size and phenomenal growth of agricultural labour in India?
5. State the factors that have kept landless labourers in India in a state of perpetual poverty, what steps have been taken by the government to improve their plight.

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### 10.8 FURTHER READINGS

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## BLOCK - III

### AGRICULTURAL MARKETING AND AGENCIES

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## UNIT 11 AGRICULTURAL MARKETING

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**Structure**

- 11.0 Introduction
  - 11.1 Objectives
  - 11.2 Structure of Agricultural Marketing
    - 11.2.1 Meaning and Importance of Agricultural Marketing
  - 11.3 Function of Agricultural Marketing
  - 11.4 Margin and Efficiency
    - 11.4.1 Operational Efficiency
    - 11.4.2 Pricing Efficiency
  - 11.5 Measures to Improve Marketing Efficiency
  - 11.6 Marketing System in India
  - 11.7 Finances of Agricultural Marketing
  - 11.8 Answers to Check Your Progress Questions
  - 11.9 Summary
  - 11.10 Key Words
  - 11.11 Self Assessment Questions and Exercises
  - 11.12 Further Readings
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### 11.0 INTRODUCTION

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Before Independence, an ordinary Indian farmer was poor and lacked power; he tried to sell off his produce immediately after harvesting the crop, even if prices in the market at that time happened to be low. Prices immediately following harvest were generally low due to availability of excessive supplies in the market at that time. Most farmers virtually had no knowledge of the local market (*mandis*). In the absence of a marketing information system, they had no knowledge regarding the prices that ruled in different *mandis*. Therefore, they had no option but to accept whatever prices were offered to them. Due to a total lack of institutional sources of credit, the farmers depended totally on moneylenders whose sole objective was to exploit the farmers. Thus after Independence, the policy makers of our country decided to develop an efficient agricultural marketing system in our country.

Since Independence, the agricultural produce sector has been one of the most important components of the Indian economy. The increasing trend of agricultural production has brought in its wake, new challenges in terms of finding market for the marketed surplus. There is also a need to respond to the challenges

and opportunities that the global markets offer in the liberalized trade regime. To benefit the farming community from the new global market access opportunities, the internal agricultural marketing system in the country needs to be integrated and strengthened. The Government of India is striving to prepare the Indian agricultural markets and marketing environment so as to provide maximum benefit to the producers and in turn, compete with the global markets. Agriculture and agricultural marketing needs to be reoriented to respond to the market needs and consumer preferences. Agricultural marketing reform and creation of marketing infrastructure has been initiated to achieve the above purpose.

In this unit, you will study about the structure of agricultural marketing, different sources of marketing agencies, measures for improving marketing efficiency, types of Cooperative Marketing Societies functioning in India, functions and finances of agricultural marketing.

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### 11.1 OBJECTIVES

After going through this unit, you will be able to:

- Analyse the structure of agricultural marketing
- Discuss the different sources of marketing agencies
- Identify the measures for improving marketing efficiency
- State the types of Cooperative Marketing Societies existing in India
- List the functions of agricultural marketing
- Explain the finances of agricultural marketing

### 11.2 STRUCTURE OF AGRICULTURAL MARKETING

Agricultural marketing is a central parameter in the context of agricultural growth. Timely and remunerative sale of agricultural products motivates the farmers to make strong efforts in all areas of farming. In fact, a rational farmer keeps one eye on the plough and the other on the market. Unfortunately, in India, the agricultural marketing suffers from certain serious drawbacks. Farmers often fail to get fair price for their produce. More often than not, they are the victim of ‘Paradox of Plenty’: greater the production, lesser the revenue; as prices tends to crash owing to bulk sales in the market.

Accordingly, farming in India is more like a gamble in futures rather than an avenue of secured income. In the context of the Indian agriculture, one can say that marketing is a menace and a serious threat to the inducement to invest. Supply price response is extremely limited in agriculture, because of which farming has failed to emerge as a profit-yielding enterprise. Most farming population in India continues to consider farming merely as a source of subsistence. Exposure of

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farming to the market forces of supply and demand remains grossly limited owing to the continuation of a primitive marketing structure. To quote Royal Commission Report 'Problem of agricultural growth cannot be fully solved unless agricultural marketing is improved.'

### 11.2.1 Meaning and Importance of Agricultural Marketing

Agricultural marketing does not simply refer to the sale of agricultural production. It is a very wide term encompassing all such activities that are related to the procurement, grading, transporting and finally selling of agricultural produce. In the words of Faruque, 'Agricultural marketing comprises all operations involved in the movement of farm produce from the producer to ultimate consumer.' Broadly, agricultural marketing includes the following operations, besides the sale of agricultural production:

- Arrangements regarding collection of agricultural produce
- Arrangement for grading and standardizing the product
- Processing of the products, if required
- Warehousing facility for storage
- Cold storage facility for the perishable products
- Transportation facility
- Credit facility to cope with cash requirement prior to sale or marketing of the produce

Once marketing structure gets developed, marketable surplus starts responding to the relative price structure and the agriculture starts like other business enterprises.

### Different Sources of Marketing Agencies

In the context of agricultural production, there are diverse outlets of marketing in India. Following are the notable ones:

- **Sale in local markets:** Farmers in India tend to sell the bulk of their produce in the unorganized local markets. According to an official estimate, in Bihar and Bengal, 89 per cent and 72 per cent (respectively) of the total rice output is sold in the local markets. The All India Rural Survey Committee observes that, on an average, an Indian farmer sells nearly 35 per cent of his produce in the village itself and 24 per cent of it to the traders and commission agents in the rural areas. In the local markets, the agricultural produce is sold in three different ways:
  - o In the rural fairs/bazaars
  - o Directly to the Mahajans or moneylender
  - o To the mobile traders of the urban areas

Local sale does not fetch any competitive price. It is more like desperate sale at desperate price.

- **Sale in urban markets:** Urban markets in India are of two types:

- o Unregulated markets
- o Regulated markets

In the unregulated markets, the bulk of the farmers' produce is purchased by the commission agents who also happen to be moneylenders. However, the number of unregulated markets is gradually reducing. Most of the markets are being regulated offering fair price to the farmers under the direct supervision of the market committee.

- **Other outlets of sale:** There are various other outlets of sale. They include the following:

- o Sale through co-operative societies
- o Direct sale to the government

Direct sale to the government is facilitated through Food Corporation of India, Jute Corporation, Cotton Corporation of India and various other institutes.

#### Check Your Progress

1. What is the central parameter of agricultural growth?
2. What does agricultural marketing comprise?

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### 11.3 FUNCTION OF AGRICULTURAL MARKETING

The primary functions of agricultural marketing are the following:

- i. **Assembling:** The first function of agricultural marketing includes collection of produce for sale in the different *mandis*.
- ii. **Grading and standardization:** The second function of grading involves sorting of produce as per the size, quality, colour and texture. The procedure of standardization helps to confirm the grading procedure such that it remains standard or usual throughout the year.
- iii. **Processing:** The third important function of agricultural marketing involves processing the agricultural produce into a consumable form. For instance, wheat is converted into flour, the preparation of ghee and butter from milk and so forth. One significant advantage of processing is that it facilitates in conserving surplus produce which otherwise might go wasted.
- iv. **Transportation:** The next vital function is that of transporting the final produce to the end consumer by means of road, railways, air and water.

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The means of transportation should be such that the perishable products reach the consumer in good condition.

- v. **Storage:** Local *mandis* receive food products from all across the country. Hence, it is vital to provide apt storage facilities for fruits, vegetables and other items. There are certain items which require cold storage facility as well.
- vi. **Packaging:** This function includes packing the product as per its size and variety to be sold in the market. One major advantage of packaging is that prevents deterioration of the food product.
- vii. **Distribution:** Distribution function includes the role of wholesalers, retailers and marketers.

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## 11.4 MARGIN AND EFFICIENCY

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The marketing system can be effective without being efficient. For example, Indonesia is a country comprised of thousands of islands (not all of which are inhabited). Bulog in Indonesia was charged with the onerous responsibility of physically distributing rice and ensuring that everyone was supplied with their basic food requirement. (Hence, the name, Bureau of Logistics— Bulog). Before Indonesia became capable of being self-sufficient in the staple food, the sole criterion of Bulog's success or failure was due to its effectiveness in delivering rice to wherever it was needed. The cost involved in such delivery was a secondary consideration as long as Bulog could keep its costs within the budget allotted to it.

Increased efficiency is in the best interests of farmers, traders, processors, wholesalers, retailers, consumers and society as a whole. The efficiency of a marketing system is measured in terms of the level and/or costs to the system of the inputs, to achieve a given level and/or quality of output. Such inputs are generally in the form of land, finance, time, manpower and materials. Typical outputs include the movement of a given amount of product to markets at specific distances, the supply of a particular level of service to target market segments and the supply of products at a target price. Hence, resources are the costs and utilities are the benefits that comprise the marketing efficiency ratio. Efficient marketing optimises the ratio between input and output.

### 11.4.1 Operational Efficiency

Improved operational efficiency is evident where marketing costs are reduced but outputs are either maintained or increase. For example, operational efficiency gains would be the introduction of a less expensive method of storing grain or an innovative milk package that reduces energy costs when the product reaches the retailers. Technological innovations are not the only avenue leading to higher levels of operational efficiency. An organization that improves its raw material procurement practices, by say centralizing purchases, buying in larger quantities or taking

advantage of unit freight rates, is likely to increase operating efficiency. In the same way, an organization that rearranges sales territories and distributes fewer but larger loads to each delivery point can improve its levels of operational efficiency. Physical losses as commodities, produce or products move through the channels of distribution is another aspect of operational efficiency. The higher the losses, the lower the level of operational efficiency.

In practice, changes in the cost of marketing influence consumers' satisfaction, and efforts to increase the customers utility often affect marketing costs. A new marketing practice that reduces costs but also reduces consumers satisfaction may reduce the efficiency ratio. For instance, Millers might improve efficiency by withdrawing 5 kg bags of meal from the market and sell minimum quantities of 10 kg of bags. If a substantial number of consumers prefer to buy the 5 kg bag then the decrease in customer satisfaction could be greater than the gains made in cost reduction to the Miller. The compromise which must be made between operational efficiency and customer satisfaction explains the difficulty of improving marketing efficiency. It is not difficult to reduce marketing costs by taking such measures as reducing the number of pack/bag sizes, eliminating packaging or reducing the number of retail outlets supplied but there may be a greater loss in customer satisfaction than is compensated for by the fall in marketing costs and retail prices. When evaluating any marketing change intended to improve marketing efficiency, both cost reductions and customer utility must be considered.

Marketing firms, operating within a competitive environment, are especially well-motivated in seeking to increase operational efficiency. Although their goal may be higher profits, often the benefits of improved operations accrue to customers in the form of lower prices. Competition acts as a brake on the extent to which profits increase and limits any tendency for customer service and satisfaction levels to fall.

#### 11.4.2 Pricing Efficiency

Pricing efficiency is the second form of marketing efficiency and is based on the assumption that competitive markets are efficient. It is concerned with the ability of the marketing system to allocate resources and coordinate the entire agricultural/ food production and marketing process under consumer directives. The evidence of pricing efficiency is an efficient resource allocation and maximum economic output. Possibly the best measure of the satisfaction-output of the marketing system is the price that customers will pay in the marketplace for the produce, commodity or product in question. If consumers are willing to pay three cents more per orange for orange juice than for fresh oranges, it can be inferred that the process of juicing adds three cents of form utility to fresh oranges. The pricing mechanism directly affects production, in this instance, by indicating that a certain amount of the available oranges should be processed rather than sold as fruit.

Kriesberg says that the use of pricing efficiency measures in evaluating any marketing system depends upon four conditions:

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- i. Do customers have alternatives from which to choose in the marketplace? In other words, the measure has little relevance to situations where there is an effective monopoly.
- ii. The prices of alternatives adequately reflect the costs of providing them. That is, there are no subsidies hidden or otherwise for competitive products.
- iii. Organizations must be free to enter or leave the market.
- iv. There must be competition between those in the marketplace. For example, cartel-like behaviour should not be in evidence.

Theory suggests that if markets are operating efficiently then prices of a given product will be related over space and time and between forms. Prices should only differ between geographic areas of a country by transportation costs from one point to another. Similarly, the price of storable products at one point in time should not exceed the price in a previous period in time by more than the cost of storage. And, again, the price of a processed product should not exceed the price of the unprocessed equivalent by more than the cost of processing.

Advocates of the pricing efficiency concept believe that prices which do not reflect the costs of marketing services are clues to functional deficiencies, chief among them being monopolistic power. Competition plays an important role in determining the pricing efficiency. Market-oriented organizations compete for custom by lowering marketing costs, increasing operational efficiency wherever possible, and at the same time, adding more utility to the products to gain more market share.

### Identifying marketing costs and margins

Marketing costs are incurred when commodities move from the farm to the final market, whether they are moved by farmers, intermediaries, cooperatives, marketing boards, wholesalers, retailers or exporters. With increased urbanization and industrialization, marketing costs tend to increase relative to the farm gate price received by the farmer, i.e., the product moves greater distances, through more intermediaries and is more sophisticated in its packaging. Marketing costs can also reflect the state of a country's development in that as standard of living increases, smaller proportions of income are expended on raw products of the farm and greater proportions are spent on additional and improved marketing services. Increasing the value-added means, among other things, that more people in developed countries are involved in marketing agricultural products than in producing them.

Marketing costs include labour, transport, packaging, containers, rent, utilities (water and energy), advertising, selling expenses, depreciation allowances and interest charges. Marketing costs vary from commodity to commodity and product to product. There are several factors that individually or collectively account for these differences. These include the following:



- i. The more waste the greater the proportion of customers' expenditure which goes on marketing costs.
- ii. The more perishable the product the greater the marketing costs.
- iii. The more processing of the commodity the greater the marketing costs.
- iv. The greater the amount of produce handling and transportation the greater the marketing costs.

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### 11.5 MEASURES TO IMPROVE MARKETING EFFICIENCY

Agriculture marketing in India has certain serious deficiencies. As a result, farmers are often deprived of fair price for their produce. Following are some notable deficiencies:

- **Lack of finance:** Marketing is closely linked with finance. For their financial needs, the small farmers invariably depend on the traders and money lenders. The traders and moneylenders often give loans on the condition that the produce is sold to them directly. Accordingly the farmers become vulnerable to exploitation.
- **Distressed sale:** An average Indian farmer seldom sells his produce under the distress of poverty. The compulsion to sell produce immediately after the harvest arises on following account:
  - o Pressure of repayment of loans to the Mahajans and banks
  - o Domestic needs of the farmers
  - o Poor holding capacity of the farmer

Often the farmer has to sell his produce at an unfavourable time and on unfavourable terms.

- **Lack of collective bargaining:** Indian farmers lack collective bargaining. There are millions of small and marginal producers who would hardly form a united front. Often, they bring their produce to the market as individual competitors. The obvious consequence of which is low price and loss of revenue. Royal Commission on Agriculture observed that, 'So long as the farmer does not learn the system of marketing himself or in co-operation with others, he can never bargain better with the buyers of his produce who are often very shrewd and well informed.'
- **Lack of grading:** Farmers in India do not appreciate the significance of grading the produce. Qualitatively good and bad crops are not separated. Mixed with poor quality grain, even the good quality grain fetches a low price.
- **Lack of proper storage facility:** There is a lack of proper storage facility in the rural areas. Crops are often dumped in the underground pits that are

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vulnerable to pests and insects. This often forces the farmer to sell his produce at times when there is a glut in the market and the price is low.

- **Multiplicity of intermediaries:** Multiplicity of intermediaries is an equally serious defect in the marketing system in India. There is a long chain of intermediaries between the farmer and the final consumer, who appropriate the bulk of profit that otherwise would have accrued to the farmers. It is estimated that the farmer gets just 55 paise out of a rupee worth sale of rice, and just 50 paise out of a rupee worth sale of wheat. On an average, farmer receives just 60 per cent of the price paid by the final consumer, the rest 40 per cent goes to the intermediaries.
- **Lack of market knowledge:** Farmer usually lack knowledge of prevailing market conditions. They are solely dependent upon commission agents for the price of their produce. Often they sell their produce at low prices in the nearby markets dominated by commission agents and Mahajans.
- **Transport bottlenecks:** There is a general lack of economical and fast means of transport between the rural and urban areas. Transportation of crop is often done by means of bullock carts. This is a very slow means of transport and is vulnerable to the weather. High transport cost is the net consequence that comes to nearly 20 per cent of the value of output.
- **Malpractices:** Malpractices in the markets is a common feature. These relate to weights and measures, and clandestine fixation of the price of the produce by the brokers and commission agents. Royal Commission on Agriculture very rightly observed, 'Fraudulent practices in the markets are nothing short of day light robberies.'

### Strategies to Combat Deficiencies

To combat deficiencies of agricultural marketing system in India the Government has initiated various measures. Some of the important ones are as follows:

- **Price support:** The government offers price support to the farmers with a view to regulate their income. The government offers to buy any quantity of the produce at the stipulated price. The prices are fixed by the Commission for Agricultural Costs and Prices. Support price is annually reviewed with a view to insulating the farmers against the uncertainties of the market.
- **Standardization of weights and measures:** With a view to ensuring uniform weights and measures in different parts of the country, the government introduced metric system of weights and measures in 1958. In 1966, old weights and measures were completely abolished. Weight inspectors were appointed to supervise the use of metric weights. This has surely reduced exploitation of the farmers in the markets to some extent.

- **Means of transport:** Means of transport have been significantly developed during the last three Five Year Plans. Presently, roads are being developed under the 20-year Hyderabad plan. According to this plan, no village in India should remain at a distance of more than 4 km from the metalled roads.
- **Development and grading of agricultural produce:** Agricultural Produce, Grading and Marketing Act, 1937 was passed with a view to improving the grading of the agricultural produce. It was amended in 1986. Various 'AGMARK' centre have been opened for the standardization of agricultural products. On the recommendation of the Planning Commission in 1952, classification of agricultural produce (for exports) was made compulsory. Central Quality Control Laboratory as well as sixteen regional labs have been established for the standardization of agricultural products. So far nearly 164 products have been classified and standardized.
- **Storage facilities:** To improve storage facilities for the farmers, the government has accorded high priority to the construction of godowns like National Cooperative Development Warehousing Corporation was established in 1956, National Cooperative Development Corporation was established in 1963 and Central Warehousing Corporation was established on March 18, 1962. This corporation constructs godowns for the use of Food Corporation of India. Sixteen state Warehousing Corporations have been set up in different parts of the country. Food Corporation of India has the total storage capacity of 235 lakh tonnes. Godowns of the State Corporation have a total capacity of 114 lakh tonnes. Indian Grain Storage Institute has been established in Hapur. This institute offers a variety of scientific information related to grain saving. Rural Development Corporation has established 3,354 godowns in the rural areas. National Co-operative Development Corporation has established 247 cold storages of the capacity of 7.4 lakh tonnes. In 2003, there were 3,546 cold storages in India. The total storage capacity in India was 429 lakh tonnes. During the Eighth Plan, ₹424 crore has been spent on the expansion of storage capacity in India.
- **Cooperative marketing societies:** Co-operative marketing societies have been established in order to be helpful in the context of agricultural marketing. The societies organize for the collective sale of the produce of their members. The farmers are thus, freed from the clutches of the middle men. These cooperative societies also have their own storage facilities. These also offer credit facilities to their members. A notable progress has been registered to these societies in the States of Punjab, Haryana, U.P., Maharashtra and Gujarat. These societies have shown an audible growth from the Second Five Year Plan onwards. In the year 2001, there were 6,980 primary

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cooperative marketing societies; 186 central cooperative marketing societies and nineteen state cooperative marketing societies. The National Agricultural Cooperative Marketing Federation was established in 1964 with the view to coordinate the activities of various societies as well as to encourage the international trade. The societies also work for food corporations in different parts of the country. In 2001, these societies recorded marketing of crops worth ₹13,600 crore.

- **Marketing intelligence:** The government has arranged for the distribution of marketing information for the benefit of the farmers. The All India Market News Service has been launched specifically for this purpose. Prices in different markets of the country are broadcasted everyday through the All India Radio.
- **Regulated markets:** Regulated markets have been established in different parts of the country beginning with the one in Hyderabad in 1943. Some of the important features of these markets are as follows:
  - o Market committee supervises the marketing operations
  - o Producers, traders and representatives of the local self government are members of marketing committees
  - o Traders and brokers are required to obtain licenses for their work
  - o Commission and brokerage are determined by the market committees only
  - o Weights and measures are used under the strict supervision of the committees
  - o The committees disseminate information regarding the prevailing prices in the market
  - o For the coordination between the marketing committees of Punjab and Haryana, the government of these states has established State Agricultural Marketing Boards
- **Agricultural marketing organization:** Directors of Marketing and Inspection has been established with a view to improving agricultural marketing. It focuses on the following activities:
  - o Research
  - o Development
  - o Grading

The Directorate also supervises sale and purchase activities. It has established a Marketing Extension Cell. It publishes marketing newsletter, marketing extension newsletter and agricultural marketing for the benefit of the farmers. It also offers marketing training to the farmers.

## 11.6 MARKETING SYSTEM IN INDIA

Agricultural marketing plays a crucial role in the context of agricultural development in India. Success of any policy related to agricultural growth hinges upon an efficient system of marketing.

Agricultural marketing in India is present in four forms:

- Sale in villages to village traders and moneylenders
- Sale in weekly markets or haats
- Sale in wholesale private mandis
- Sale in regulated mandis as wholesale to dalaals who then sell it to factories, retailers and mills. In India, APMC regulates the workings of these mandis and FCI purchases or procures the agricultural products from here.
- Sale through cooperatives

Since, the last is very prevalent in India and unique, we will be discussing this in detail in this section.

In the words of Prof. V. Jesons, 'Cooperative marketing means working together for mutual benefit in solving marketing problems' and cooperation of the farmers for their own common good, relating to the sale of their produce and purchase of various inputs.

### Objectives

Some of the principal objectives of cooperatively farming are as follows:

- These societies sell the produce of their members at the appropriate price and at appropriate time.
- These societies offer a storage facility to the members.
- Loans are offered to the member farmers in times of need.
- Information related to market prices is offered to the members
- The societies purchase and procure all the necessary inputs (seeds, fertilizers, etc.) for their members

### Organization and Types of Cooperative Marketing Societies in India

Prior to 1954, cooperative marketing societies in India confined themselves solely to the activity of marketing the produce of the member farmers. These were separate from the credit societies. The marketing societies become multi-purpose societies after the All India Rural Credit Survey Report. Following are the important types of co-operative marketing societies in India:

- **Primary cooperative marketing societies:** These societies operate at the village level. They are formed not just to handle the marketing problems of their members, but also to monitor their credit needs besides the need for

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seeds, fertilizers and other inputs. These are nearly 6,980 such societies in India.

- **Central cooperative marketing societies:** Central cooperative societies are formed like a federation of the various primary societies in a particular area. These address issues/problems commonly experienced by primary societies. These are based both in the rural as well as urban areas. There are nearly 186 such societies in India.
- **State cooperative marketing societies:** These are the apex cooperative institutions in different states of the country. They bolster activities of the primary societies through the central cooperative societies. These are generally located in the state capitals, and are nearly nineteen in number.
- **National Agricultural Cooperative Marketing Society (NAFED):** It works at the national level to coordinate the activities of various marketing societies in India, as well as to stimulate domestic and international trade, related to agricultural products.

### How do the cooperative marketing societies function?

Members of the cooperative marketing society dispose-off their marketable surplus through the society only. As the produce is produced by the society, it offers some advance payment to the members to meet their routine needs. After procurement, the crops are processed for final sale in the market. The sale is done without the involvement of middlemen. In case the prevailing prices are not remunerative, crops are stored and sold later. After the final sale happens, the society pays its members their dues, adjusting for the advance payment already made. The society employs workers to handle its routine affairs, but the overall management vests with the committee of elected members.

### Progress of cooperative marketing in India

Cooperative marketing societies have made a noticeable progress over time. Progress of these societies has been particularly evident in the States of Maharashtra, Gujarat, A.P., Tamil Nadu, Punjab, Haryana and Bihar. These societies are rendering useful services in the process of procurement of staple crops like wheat and rice and commercial crops like cotton and jute.

### Merits of cooperative societies

Following observations highlight the merits of cooperative societies:

- **Elimination of middlemen:** Thanks to cooperative societies, a chain of middlemen between the farmer and the final purchaser has been eliminated. This has helped combat in unwarranted price-rise, ensuring at the same time that the farmers get remunerative price for their produce.

- **Reduction in marketing cost:** Marketing expenses have gone down due to the collective sale. It also saves the farmer from various customary deductions relating to weighing and vigilance.
- **Collective bargaining and remunerative price:** Cooperative societies have succeeded in reaping the advantages of collective bargaining because of collective sale of the farmers' produce. Individually, the farmer has very poor bargaining power in India. Collectively, the farmers are able to exercise their bargaining power and appropriate gains in terms of a remunerative price for their produce.
- **Relief from distressed sale:** By offering periodic loans to the members, the cooperative societies have reduced vulnerability of the small and marginal farmers to the rural moneylenders. The availability of loans from the societies has reduced the incidence of distressed sale.
- **Grading and storage:** Facility of grading offered by the society helps in standardization of the produce. The societies also provide storage facility that enhances holding capacity of the farmers. Consequently, income of the farmers also gets enhanced.
- **Procurement facility:** With a view to facilitate procurement of the members' produce, the cooperative societies set up collection centers at convenient locations. It saves farmers' cost of transportation. Also, it alleviates stress on the scarce means of transport in the rural areas.
- **Gluts are avoided:** The societies regulate the flow of sales in the market, avoiding situations of glut and price crash.

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### Demerits of cooperative societies

Following observations may be noted in this context:

- **Inactive societies:** There is a large number of inactive societies in the country. Nearly 40 per cent of the inactive societies do not handle trade worth even 5 lakhs. These societies have yet to achieve a breakthrough in their operations.
- **Lack of co-ordination:** There is a lack of coordination among the primary, central and state co-operatives. Accordingly, the farmers tend to make independent sale of their produce directly in the market. Perhaps, the traders and commission agents continue to be a convenient source of credit for the farmers.

### Suggestions for improvement

Organization and functioning of the cooperative marketing societies show a considerable scope for their improvement. Following are some notable suggestions:

- **Multi-purpose societies:** Cooperative marketing societies should merge with other societies operating in rural areas to form multi-purpose societies.

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Such societies should be more useful in fostering not only marketing but all parameters of agricultural growth and development.

- **Direct relation with consumers:** Cooperative marketing societies should establish direct relation with the consumers. This will fetch the farmer the maximum possible price for his produce, while the consumer will pay the minimum possible, in the absence of all middlemen.
- **A vision beyond grading and storage:** Cooperative societies should develop a broad vision beyond grading and storage. They should widen their activity network by handling some processing jobs like of separating the fibre and seeds of cotton. This would further enhance effectiveness of the co-operatives and profit margins of the farmers.
- **Government agency:** The societies should function as a Government agency. For instance, the societies should ensure that the Food Corporation of India procures foodgrains only through the cooperative centres, not directly from the markets. Farmers will, thus get appropriate price for their produce; this would also enhance trust of the farmers in the societies.

## 11.7 FINANCES OF AGRICULTURAL MARKETING

The need for agriculture finance and marketing could be divided into two categories:

- I. Based on time
- II. Based on the purpose

### I. Based on time

The financial needs of farmers can be further divided into two categories:

- i. **Short Term:** The short term needs of finance cover recurring expenses borne by the farmers such as money to buy seeds, fertilizers, fodder for livestock, marketing of agriculture produce, payment of wages for hired labourer and application of pesticides.
- ii. **Medium Term:** The medium-term finance needs include money to purchase cattle, repayment and construction of wells and tube wells and for small agriculture implements.
- iii. **Long Term:** Long-term loans are required for improvement of land and soil, digging tube wells and wells, larger agriculture implements and machineries like tractors and harvesters. Further, such a loan could be procured to pay old debts also.

### II. Based on the purpose

The agricultural finance needs of the farmer could be divided into the following categories based on the purpose:



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- i. *Productive:* The productive needs will include all credit requirements which directly affect agricultural productivity. Farmers need loans for the purchase of seeds, fertilizers, manures, agricultural implements, livestock, digging and repair of wells and tube wells, payment of wages, effecting permanent improvements on the land, marketing of agricultural produce, etc. Repayment of such loans is generally not difficult because the very process of production generally creates the withdrawal for repayments.
- ii. *Consumption need:* Farmers often require loans for consumption as well. Institutional credit agencies do not provide a loan for consumption purpose. Therefore, farmers stretch their hand towards the moneylenders.
- iii. *Unproductive:* Loans are taken for unproductive purposes such as litigation, marriages, social ceremonies (such as birth and death of a family member), religious functions, festivals etc. Farmers take loans from Mahajans since institutional credit agencies do not give such loans.

### Sources of Agriculture Finance

The sources of agriculture finance can be divided into two parts:

#### 1. Non-Institutional Sources

- i. **Moneylenders:** Moneylenders lend money to farmers for their seed requirements and marketing the produce as well. But the rate of interest is higher than the prevailing market rate. Further, the credit terms and conditions are never clear on part of the lender and borrower.
- ii. **Relatives:** The family members and relatives sometimes extend credit to fulfil the farming needs of the farmer.
- iii. **Traders:** The traders also extend the credit line based on the goodwill and acquaintance to a farmer.
- iv. **Commission Agents:** These agents charge a commission on arranging funds to a farmer for agriculture from different sources.
- v. **Landlords:** The landlords keep the land papers as collateral and extend credit lines to a farmer.

#### 2. Institutional Sources

- a. **Cooperatives:** The cooperative societies provide short-and medium-term loans to agriculture farmers. Further, they also provide long-term loans and assistance to farmers. The Primary Agriculture Cooperative Society (PACS) has played an important role in lending short-and medium-term loans. The PACS may be started by 10 or more persons. These persons belong to the village. The value of each share is generally nominal to enable even the poorest farmer to become a member of the society. The management of the

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society is under an elected body consisting of the president secretary and treasurer.

PACS has played an important role in Indian agricultural finance since Independence. The flow of credit extended by PACS is largely ensured by the Reserve Bank of India in association with the state governments. The major objective of the corporative society lies in assisting and extending development programme to the weaker sections of the society.

- b. Scheduled Commercial Banks:** Although the scope of direct financing by commercial banks was earlier limited; they are doing indirect financing through cooperative societies in the agriculture sector. The commercial banks increasingly finance and support marketing and processing of agriculture produce and other ancillary activities. Further, they also support dairy farming, poultry farming and other agriculture allied activities.

Commercial banks increasingly subscribe to debenture of central land development and enable land development banks to expand their medium and long-term advances to farmers for land improvement and land development.

- c. Regional Rural Banks:** The main objective of RRBs is to provide credit and other facilities particularly to small and marginal farmers, agricultural labourers, artisans and small entrepreneurs and to develop agriculture trade, commerce and other productive activities in the rural area.

Initially, 5 RRBs were set-up in 1975 with a share capital contributed by the central and state government in the ratio of 50:50 per cent. The scope of RRBs is limited to one or more districts of the state. The regional rural bank grants direct loans and advances to small and marginal farmers, agricultural labourers and others of small means for productive purpose. The lending rates of RRBs should not be higher than the prevailing lending rates of the cooperative societies in any particular state or district. The sponsoring bank and the Reserve Bank of India provide many subsidies to enable RRBs to function effectively.

To extend credit line and development in the rural agriculture finance, the National Agricultural Refinance Development Corporation was set-up to support and promote programmes of agricultural development to extend credit finance. This bank was set-up in the year 1982 by an Act of Parliament. The authorised share capital of the National Bank was ₹500 crores and the paid-up capital was ₹ 100 crores which was contributed equally by the central and state governments.

NABARD services include refinance and extending credit line for production, investment in agriculture, small scale industries, cottage and village industries, handicraft rural craft and allied economic activities. Further, it also extends long-term loans to institutions based on the recommendations of the central government.

It maintains research and development fund to promote research in agriculture and rural development to formulate and design projects to cover special activities. Finally, NABARD gives long-term loans for up to 20 years to the central and state governments to subscribe to the share capital and strengthen and reorganize the cooperative credit structure in the country.

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### Check Your Progress

3. Which are the ways of selling agricultural produce in local markets?
4. Which are the two types of urban markets in India?
5. What do you mean by cooperative marketing?
6. What are primary cooperative marketing societies?
7. What do you understand by the term 'pricing efficiency' of agricultural market?
8. Name the non-institutional sources of agricultural finance.

## 11.8 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Agricultural marketing is a central parameter in the context of agricultural growth.
2. Agricultural marketing does not simply refer to the sale of agricultural production. It is a very wide term encompassing all such activities that are related to the procurement, grading, transporting and finally selling of agricultural produce.
3. Two different ways of selling agricultural produce in the local markets are the following:
  - i. In the rural fairs/bazaars
  - ii. Directly to the Mahajans or moneylender
4. Urban markets in India are of the following two types:
  - i. Unregulated markets
  - ii. Regulated markets
5. Cooperative marketing means working together for mutual benefit in solving marketing problems.
6. Primary cooperative marketing societies operate at the village level. They are formed not just to handle the marketing problems of their team members but also to monitor their credit needs besides the need for seeds, fertilizers and other inputs.

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7. Pricing efficiency is the second form of marketing efficiency and is based on the assumption that competitive markets are efficient. It is concerned with the ability of the marketing system to allocate resources and coordinate the entire agricultural/food production and marketing process under consumer directives. The evidence of pricing efficiency is an efficient resource allocation and maximum economic output.
8. The non-institutional sources of agricultural finance are the following:
  - Moneylenders
  - Relatives
  - Traders
  - Commission agents
  - landlords

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## 11.9 SUMMARY

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- Agricultural marketing is a central parameter in the context of agricultural growth. Timely and remunerative sale of agricultural products motivates the farmers to make strong efforts in all areas of farming.
- In the context of the Indian agriculture, one can say that marketing is a menace and a serious threat to the inducement to invest.
- Agricultural marketing does not simply refer to the sale of agricultural production. It is a very wide term encompassing all such activities that are related to the procurement, grading, transporting and finally selling of agricultural produce.
- Agriculture marketing in India has certain serious deficiencies. As a result, farmers are often deprived of fair price for their produce.
- Co-operative marketing societies have been established in order to be helpful in the context of agricultural marketing. The societies organize for the collective sale of the produce of their members.
- Agricultural marketing plays a crucial role in the context of agricultural development in India. Success of any policy related to agricultural growth hinges upon an efficient system of marketing.
- Prior to 1954, cooperative marketing societies in India confined themselves solely to the activity of marketing the produce of the member farmers. These were separate from the credit societies.
- Improved operational efficiency is evident where marketing costs are reduced but outputs are either maintained or increase. For example, operational efficiency gains would be the introduction of a less expensive method of

storing grain or an innovative milk package that reduces energy costs when the product reaches the retailers.

- Pricing efficiency is the second form of marketing efficiency and is based on the assumption that competitive markets are efficient. It is concerned with the ability of the marketing system to allocate resources and coordinate the entire agricultural/food production and marketing process under consumer directives.
- Marketing costs are incurred when commodities move from the farm to the final market, whether they are moved by farmers, intermediaries, cooperatives, marketing boards, wholesalers, retailers or exporters.

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### 11.10 KEY WORDS

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- **Co-operative marketing societies:** These have been established in order to be helpful in the context of agricultural marketing. The societies organize for the collective sale of the produce of their members.
- **Malpractices:** It refers to negligent conduct by a professional person which results in damage to others.
- **Commission agent:** This term refers to someone who sells a company's products and receives a part of the money paid for the goods for doing this act.

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### 11.11 SELF ASSESSMENT QUESTIONS AND EXERCISES

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#### Short-Answer Questions

1. Write a short note on the structure of agricultural marketing.
2. State the importance of agricultural marketing.
3. What are the different sources of marketing agencies in India?
4. List the functions of agricultural marketing.

#### Long-Answer Questions

1. Discuss the measures which assist in improving marketing efficiency.
2. Explain the organization and types of Cooperative Marketing Societies existing in India.
3. Examine the finances of agricultural marketing in India.

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## 11.12 FURTHER READINGS

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### NOTES

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## UNIT 12 ROLE OF FCI AND STATE AGENCIES

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*Role of FCI and State  
Agencies*

### NOTES

#### Structure

- 12.0 Introduction
- 12.1 Objectives
- 12.2 Role of FCI
- 12.3 State Agencies - Price Expectation
- 12.4 Price Uncertainties
  - 12.4.1 Yield Uncertainty
  - 12.4.2 Price Uncertainty
  - 12.4.3 Tenurial Uncertainty
  - 12.4.4 Uncertainty with regard to Input Prices/Quality
- 12.5 Price Stabilization
- 12.6 Answers to Check Your Progress Questions
- 12.7 Summary
- 12.8 Key Words
- 12.9 Self Assessment Questions and Exercises
- 12.10 Further Readings

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### 12.0 INTRODUCTION

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The agricultural sector in India is largely dependent on nature for irrigation purposes. This sector certainly faces uncertainties with respect to the yield, prices and other aspects. In order to bring the various uncertainties under control, the Indian Government has been taking several measures from time to time. FCI established in 1964 has played a major role in India's success in transforming the crisis management oriented food security into a stable security system.

The Agricultural Price Commission (APC) was set up in 1965 with the clear vision of a price policy which used different price instruments such as the MSP and procurement prices not only to incentivize agricultural production, but also to encourage the efficient use of natural resources along with providing remunerative prices to farmers.

The Indian government faces the challenge of formulating a sound price policy with the objective of providing remunerative prices to farmers and inexpensive food to the people of the country.

In this unit, you will study about the role of FCI, STC and agricultural price policy in stabilizing and controlling uncertainties in the agricultural sector.

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### 12.1 OBJECTIVES

After going through this unit, you will be able to:

- State the establishment of the Food Corporation of India (FCI)
- List the objectives of the State Trading Corporation (STC)
- Define yield uncertainty and tenurial uncertainty
- List the significant features of the agricultural price policy

### 12.2 ROLE OF FCI

The main agency providing foodgrains to the PDS is the Food Corporation of India (FCI) set up in 1965. The primary duty of the Corporation is to undertake the purchase, storage, movement, transport, distribution and sale of foodgrains and other foodstuffs. It ensures on the one hand that the farmers get remunerative prices for their produce and on the other hand the consumers get foodgrains from the central pool at uniform prices fixed by the Government of India.

The Corporation has also been entrusted with the responsibility of maintaining buffer stocks of foodgrains on behalf of the government. With the increasing production of wheat and rice in recent years and the increasing demands on the PDS, the role of FCI has also increased as it is the sole repository of foodgrains meant for the PDS. FCI has the following achievements to its credit:

- Ever since FCI started its procurement operations, the levels of procurement have increased considerably enabling the government to build up adequate buffer stocks on the one hand, and to meet the requirements of the PDS on the other.
- With the increase in the domestic procurement of foodgrains by the FCI, dependence on imports of foodgrains has declined considerably enabling the country to save valuable foreign exchange.
- Since a major part of the FCI's procurement operations is in the nature of price support purchase, the FCI has arrested price declines to unremunerative levels.
- By supplying foodgrains through the PDS at 'affordable' price, the FCI has helped in reducing the inflationary pressures on the one hand, and has enabled the low income groups to meet, their foodgrains requirements on the other hand.
- The FCI has played an important role in building up scientific storage capacity in the country. This has not only enabled the country to build up buffer stocks, it has also helped in reducing losses on storage.



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## 12.3 STATE AGENCIES - PRICE EXPECTATION

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*Role of FCI and State  
Agencies*

The idea of state trading first evolved during the Second World War when a supply department was set-up under the control of Shri M.S.A. Haider on the pattern of United Kingdom's Commerce Corporation in the UK.

On the recommendations of the Deshmukh Committee chaired by Dr P. S. Deshmukh and the review committee headed by Shri S.V. Krishna Murthi Rao, the Government accepted the proposal of establishing the State Trading Corporation as a registered body under the Indian Companies Act.

**Establishment:** The State Trading Corporation (STC) was set-up by the Government in May 1956 incorporated under the Indian Companies Act, 1956. It was designed as the sole import-export agency as may be decided by the Government of India from time to time. Initially, it was established to deal with bilateral trading partners largely in the socialist block. It has now become a wholly-owned holding company of the Project and Equipment Corporation of India Limited.

**Management:** The State Trading Corporation is a registered company under the Indian Companies Act and managed by a Board of Directors including both executive and non-executive directors. It is headed by a Chairman.

### Objectives of the STC

1. To organize and undertake trade in socialist countries as well as other countries in commodities entrusted to the company from time to time by the Government of India and to undertake the purchase, sale and transport of such commodities in India or elsewhere in the world.
2. To undertake at the instance of the Union Government of India import and/or internal distribution of any commodity in short supply to stabilize prices and rationalize distribution.
3. To implement such a special arrangement for imports/export, internal trade or distribution of particular commodities as the Union Government may specify in the public interest.
4. To arrest the declining trend in exports or to boost export by introducing new products in new markets.
5. To assist small exporters in their export trade.
6. To assist export-oriented organizations in their export and financial and organizational activities.

**Workings of STC:** The State Trading Corporation has completed 54 years of its existence. It has played a commendable role in achieving its objectives for which it was established.

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Some of the significant features of the functioning of STC are mentioned as follows:

**i. The Turnover of the STC:** The turnover of the STC over the years has increased. Before 1971-72 the turnover was quite insignificant but after that the increase was significant. The exports reached the highest peak during 1980-85 and started declining afterwards.

In the beginning, STC efforts were guided by the policies of the Government. But in later years, it developed the non-canalized exports of items such as marine products, garments, engineering goods and products and textiles.

**ii. Important Products:** It deals in nearly 3000 commodities including agricultural and consumer items and items of construction materials, software, miscellaneous engineering items, fresh and processed food, leather and leather products, meat and marine products. The major imports of STC are edible oils, cement, explosives, natural rubber standard and glazed newsprint. Its trade is stretched over 115 countries.

The STC has put forward several other measures in different fields:

- a) It has diversified its product range and continued to add new items to its export basket-like orthopaedic shoes, sports shoes, upper compressors. H.D. Pipe etc.
- b) Trying to spearhead the national effort to identify new markets for Indian commodities and manufactured goods and establish itself in these markets on a long-term basis.
- c) It has established 100 per cent export-oriented production units mainly with foreign collaboration and equity participation and 100 per cent buy-back arrangements.
- d) It has developed a reliable supply base for the production of quality goods in association with the state undertakings, co-operative organizations and others in selected and identified sectors. If necessary STC shall undertake investments for the development of such production base.
- e) It has taken steps for improvement in quality grading, packing etc.
- f) The STC also performs serving functions thereby bringing, buyers and sellers together and assisting them in fulfilling business contracts. It assists Government departments and industrial concerns in procuring supplies of plant and machinery from abroad. In some cases, it settles trade disputes amicably between the Indian and foreign counterpart.
- g) The original idea of its setting up was to develop foreign trade with socialist countries. It has therefore improved relations with countries of the socialist block but at the same time, its operations are wider with non-communist countries.
- h) The STC marketing expertise has been of particular advantage to small industries because they are unable to participate in foreign trade without STC support.

**Weaknesses of the STC:** There are certain inherent weaknesses of the STC and they are as follows:

- i. Though the objectives of the STC were quite clear and well-defined, yet it has not taken any major entrepreneurial decision of its own so far.
- ii. There seem to be no guidelines for the choice of new products to be exported and new markets to sell its products.
- iii. Not much expertise has been developed to locate and develop sources of supply for exportable products and also for procuring imports from sources of supply abroad.
- iv. Much of the expertise is in operation as an agent, in processing indents and tenders and transportation and distribution rather than in merchandising, procurement and marketing.
- v. The set back in the exports of non-canalized items can be attributed to STC's failure to develop an appropriate supply base and take adequate promotional steps among importers.
- vi. It is guided by the bureaucrats who lack business experience and initiative, businessmen with practical knowledge should replace them.
- vii. The interlocking of the activities of the Government of India and the STC makes possible the concealment of inefficiency under the intricate official procedure. There is an urgent need for coordinating the trade of private traders and the STC.
- viii. Moreover, the STC offices abroad have not been in a position to create an impact.

The STC has developed a sound infrastructure for the development of exports through its 20 branches in India and 18 overseas offices and a large force of trained marketing personnel. Foreign offices provide market intelligence and can pursue the STC business matters with the various parties concerned.

With this sound infrastructure, STC should not only act as a casualising agency but should also make efforts to create an image of an effective trading house on lines of Japanese trading houses. It should provide new dimensions and leadership as the biggest export house in the country. It has stepped forward towards achieving its objectives of boosting exports.

### Check Your Progress

1. When was Food Corporation of India (FCI) established? What is its main objective?
2. Mention two significant objectives of the State Trading Corporation (STC).

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### 12.4 PRICE UNCERTAINTIES

There are two major types of uncertainty which arises when the producer commits his resources to the production in the present and then waits for the outcome till sometime in the future. (This type of waiting is inherent in the nature of agriculture.) These are:

- (i) Yield uncertainty
  - (ii) Uncertainty as regards to the prices of the final products
- Other important types of uncertainty in agriculture include the following:
- (iii) Tenurial uncertainty, and
  - (iv) Uncertainty as to the likely prices and quality of inputs.

We may now briefly explain the nature of these types of uncertainty in agriculture.

#### 12.4.1 Yield Uncertainty

The main reason for this type of uncertainty in agriculture lies in the biological nature of the agricultural industry which makes the yield much more dependent upon natural factors in comparison with the products of non-farming industries. Floods, drought, epidemics, etc., affect the agricultural yield suddenly without any warning and, at times, too severely. No doubt, livestock husbandry is less dependent on weather in comparison to crop farming but a hard winter or a dry summer can still have a marked influence on livestock production. Moreover, the possibility of livestock epidemics is always there. The extent of yield fluctuation is likely to be greater in some regions as compared to others. For example, tropical regions are more prone to yield uncertainty than the temperate areas. Moreover, the yield of some crops such as cotton is more variable than that of others like wheat.

Yield uncertainty is also termed as **technical uncertainty**, as it refers to the variability in the production coefficients of a given technique.

#### 12.4.2 Price Uncertainty

In addition to yield or technical uncertainty, uncertainty also exists with regard to the prices of agricultural products. Price is more or less an uncontrolled or exogenous variable so far as the individual farmer is concerned. The farmer operates in a market structure which approximates to **perfect competition** and, therefore, the price he receives for a product of a given quality is altogether unaffected by any plan or course of action that might have been adopted. He is a price taker and not a price maker. These are the outside factors which affect prices:

- i. The behaviour of other farmers taken together;
- ii. Weather-induced random fluctuations in output

- iii. Fluctuations in national income and prosperity and
- iv. Discontinuous production cycles of the cobweb type

As stated earlier, product prices faced by the non-farm industries are also subject to fluctuations, but the degree of price uncertainty in these industries is much less than in agriculture. The main reason for this is that not only are the non-farm industries much less affected by weather generated price fluctuations but also that the monopolistic market structure in which they operate enables them to exercise greater control over prices of their products. Price fluctuations are likely to be reduced further in case of industry because it is easier to adjust the supply of its products to changes in demand when compared with agriculture.

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### 12.4.3 Tenurial Uncertainty

Another type of uncertainty that is quite conspicuous in agriculture is the tenurial uncertainty. We know that land is generally leased out to tenants. The tenant, as a farmer, does not know for how long he will be able to retain the land in his possession. He will, therefore, hesitate to make long-term improvements in land as he is not sure about earning sufficient additional returns from such improvement during the period of tenancy.

### 12.4.4 Uncertainty with regard to Input Prices/Quality

Yet another type of uncertainty is that which exists with regard to the prices and quality of inputs. This type of uncertainty is particularly important in the case of capital inputs which are generally costly and are subject to frequent qualitative improvements. The farmers generally react to this type of input price uncertainty by postponing the purchase of such inputs.

Some economists, in order to be more comprehensive, have suggested six 'Ps' indicating uncertainties. These are: Price uncertainty, Production uncertainty, Production technology uncertainty, Political uncertainty, Personal uncertainty and People's uncertainty. Some of these need further explanation. Political uncertainty refers to the uncertain political conditions in the country. Under normal circumstances, this type of uncertainty may not be there. However, Government's vague policy about land reforms and other institutions may create some uncertainty which may be included under 'Political uncertainty'. Personal uncertainty refers to the uncertainty about the welfare of farmer's family. People's uncertainty refers to the relationships of the farmer with the persons he deals with. These persons include labourers (both family & hired), bankers, landowners, neighbouring farmers from whom the farmer leases land or to whom the farmer leases out his land or other resources.

## 12.5 PRICE STABILIZATION

### NOTES

As mentioned earlier in Unit 7, the price policy plays an important role in the development of agriculture and is considered as insurance against the vagaries of the market. An important aspect of the agricultural price policy is the assurance to the farmers that his efforts to augment production through the adoption of improved technology would not become unremunerative through the price factor. The price stabilization policy can be understood as the price policy of a nation. Because it is through this that the different governments try to regulate the prices of products in the economy so that it does not hurt the small farmers as well as the consumers. As you have learnt in Unit 7, the price policy in India comes under the purview of the Commission for Agricultural Cost and Prices. But before, we learnt about its functions contributing to price stabilization, let's learn about objectives and instruments of price policy.

### Objectives of Price Policy

The main objectives of the agricultural price policy are the following:

1. To ensure a reasonable relationship between the price of foodgrains and non-foodgrain crops and between agricultural commodities and manufactured items so that the terms of trade between these two sectors of the economy do not change too sharply against one or the other.
2. To maintain an appropriate relationship of prices of competition for crops to fulfil the production targets in respect of different commodities commensurate with the rise in demand.
3. To achieve a balance between the economic interests of producers and consumers by permitting price fluctuations in a limited range.
4. To smoothen the cyclical fluctuations of price rise and reduction of seasonal fluctuations in agricultural prices to the minimum.
5. To bring about greater integration of prices between the various regions in the country so that a regular flow of marketable surplus could be maintained and exports of farm products are stimulated.
6. To stabilize the general price level in the face of an increasing public outlay to bring about economic development.
7. To ensure a proper price relationship between the commodities produced by the cultivator and the inputs required by him for agricultural production and his consumption.
8. To encourage the production of various commodities needed by the country to improve people's diet and to provide raw materials for running industries.
9. To protect the interest of the consumer by enabling him to procure foodstuff at fair prices.

As you can observe, these principles are more or less aimed towards price stabilization

*Role of FCI and State Agencies*

### **Instruments of Price Policy**

The various instruments of the agricultural price policy are the following:

- i. Support Prices:** It is one of the important instruments of the agricultural price policy. The Government announces Minimum Support Prices (MSP) for major farm products well in advance of the sowing season.
- ii. Procurement Prices:** Another instrument is in the area of procurement prices. It is regarding the fixation of procurement prices of major foodgrains. These prices form the basis for purchasing a part of the marketable surplus at below the market prices.
- iii. Public Distribution System:** The third one covers the public distribution system through the fair-price shops under the auspices of the government. These shops offer goods at issue prices fixed by the government. This is intended to safeguard the interest of low-income consumers, although there is no bar to anyone, including high-income consumers, to buy from these distribution depots.
- iv. Buffer-Stocks:** The fourth relates to the building up of buffer stocks. This is to meet emergencies and to mitigate seasonal and annual price fluctuations in prices.

### **Evaluation of Price Policy**

In a developing economy like India, the government has to play a vital and crucial role in developing agriculture along proper lines.

- i. The agricultural prices policy to induce the desired changes in agriculture is one such effort. Its success, therefore, depends as much on its correct conception and implementation, as on the other non-price efforts in and out of the agriculture sector.
- ii. Within this broad frame, the agricultural prices policy has to be assessed in terms of its contribution to the achievements of the country's objectives via the furtherance of the agricultural sector.
- iii. Rendered for the agricultural sector, the national aims of growth with equity/ social justice can be spelt out.
- iv. Equity or social justice can be administered through rise in income of the agriculturists, particularly, the small and marginal farmers.
- v. Seen at the consumers' end, this means protection of the weaker sections of the population by the provision of essential goods like foodgrains at cheap rates.

### **NOTES**

- vi. For raising production and market surpluses, prices can be used as incentive instruments. These prices can also be one important factor in increasing the income of the farmers.

## NOTES

To examine critically the price policy of the Government, we should not only consider its impact on production, market surpluses, farmers' income and consumption of the poor but also the way, the policy has affected the farm prices in its totality.

### Commission for Agricultural Cost and Prices (CACP)

**Establishment:** As mentioned earlier in Unit 7, the Agricultural Prices Commission was set-up in January 1965 to advise the Government on price policy of major agricultural commodities. To evolve a balanced and integrated price structure in the perspective of the overall needs of the economy and with due regard to the interests of the producer and the consumer. Since March 1985, the Commission has been known as the Commission for Agricultural Costs and Prices (CACP).

While recommending the price policy and the relative price structure, the Commission may keep in view the following aspects:

- i) The need to provide an incentive to the producer for adopting improved technology and for developing a production pattern broadly in the light of national requirements.
- ii) The need to ensure rational utilization of land, water and other production resources.
- iii) The likely effect of the price policy on the rest of the economy, particularly, on the cost of living, level of wages, industrial cost structure, etc.

### Functions of Commission for Agricultural Cost and Prices (CACP)

#### A. Determination of Minimum Support Prices

In formulating the recommendations in respect of the level of minimum support prices and other non-price measures, the Commission takes into account, apart from a comprehensive view of the entire structure of the economy of a particular commodity or group of commodities, the following factors:

- i) Cost of production
- ii) Changes in input prices
- iii) Input-output price parity
- iv) Trends in market prices
- v) Demand and supply
- vi) Inter-crop price parity
- vii) Effect on industrial cost structure
- viii) Effect on the cost of living



- ix) Effect on a general price level
- x) International price situation
- xi) Parity between prices paid and prices received by the farmers
- xii) Effect on issue prices and implications for subsidy

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Agencies*

## NOTES

The expenses in cash and kind incurred in production by the farmer, rent paid for leased inland, the imputed value of family labour, interest value of owned capital assets (excluding land), the rental value of owned land (net of land revenue), depreciation on farm estimates of the cost of cultivation/cost of production which is an important input for forming the recommendation of MSP, are made available to the Commission through the Comprehensive Scheme for Studying the Cost of Cultivation of Principal Crops, operated by the Directorate of Economics and Statistics, Department of Agriculture and Cooperation, Ministry of Agriculture, Govt. of India. These estimates take into account real factors of production and include all actual implements and buildings and other miscellaneous expenses.

The Commission makes use of both micro-level data and aggregates at the level of district, state and the country. The information/data used by the Commission; *inter-alia* include the following:

- (i) Cost of cultivation per hectare and structure of costs in various regions of the country and changes therein;
- (ii) Cost of production per quintal in various regions of the country and changes therein;
- (iii) Prices of various inputs and changes therein;
- (iv) Market prices of products and changes therein;
- (v) Prices of commodities sold by the farmers and of those purchased by them and changes therein;
- (vi) Supply related information - area, yield and production, imports, exports and domestic availability and stocks with the Government/public agencies or industry;
- (v) Demand related information-total and per capita consumption, trends and capacity of the processing industry;
- (viii) Prices in the international market and changes therein, demand and supply situation in the world market;
- (ix) Prices of the derivatives of the farm products such as sugar, jaggery, jute goods, edible/non-edible oils and cotton yarn and changes therein;
- (x) Cost of processing of agricultural products and changes therein;
- (xi) Cost of marketing - storage, transportation, processing, marketing services, taxes/fees and margins retained by market functionaries; and

## NOTES

- (xii) Macro-economic variables such as general level of prices, consumer price indices and those reflecting monetary and fiscal factors.

The Commission is required to convey its recommendations to the Government well before the sowing season of the crop. To interact with various interest groups, the Commission follows the sequence of steps indicated below:

- i) The Commission identifies the main issues of relevance for the ensuing season (short, medium or long turn).
- (ii) The Commission sends a questionnaire to the Central Ministries, State Governments and other organizations related to trade, industry, processors, and farmers both in the cooperative and the private sector and seeks their views on certain issues and factual information on related variables.
- (iii) The Commission holds separate discussions with the State Governments, Central Ministries/Departments and other organizations. The Commission also interacts with the research and academic institutions and keeps track of relevant studies and their findings.
- (iii) The Commission visits certain areas for on-the-spot observations and feedback from local level organizations and farmers.

### Non-Price Measures

While recommending the price policy, the Commission also suggests such non-price measures as would facilitate achievement of the objectives of the policy. In this regard, the Commission has been emphasizing, inter-alia, the following:

- (i) Establishment/Strengthening of agencies for implementation of declared price support policy
- (i) Extension of proven technology to areas where it still needs to be adopted
- (ii) Evolution of suitable technology for augmenting yield and production of crops
- (iii) Reform of market regulations and setting up new markets in areas where agricultural production has made sizeable improvement
- (iv) Improvement in the grading of agricultural produce and expansion of proper storage facilities
- (v) Arrangement for timely and speedy transportation of agricultural commodities from surplus areas
- (vi) Buffer-stock operations to impart stability to domestic price stabilization
- (vii) Utilizing the medium of external trade for domestic price stabilization
- (viii) Fiscal measures including adjustments in duties/taxes/levies
- (ix) Development of appropriate technology for processing of agricultural produce; improving the database for the formulation of price policy

### Check Your Progress

3. Name the types of uncertainty which arise in the agriculture sector.
4. What are the main instruments of the agricultural price policy?

### NOTES

## 12.6 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. The main agency providing foodgrains to the PDS is the Food Corporation of India (FCI) set up in 1965. The primary duty of the Corporation is to undertake the purchase, storage, movement, transport, distribution and sale of foodgrains and other foodstuffs. It ensures on the one hand that the farmers get remunerative prices for their produce and on the other hand the consumers get foodgrains from the central pool at uniform prices fixed by the Government of India.
2. Two significant objectives of the State Trading Corporation (STC) are the following:
  - i. To organize and undertake trade in socialist countries as well as other countries in commodities entrusted to the company from time to time by the Government of India and to undertake the purchase, sale and transport of such commodities in India or elsewhere in the world.
  - ii. To undertake at the instance of the Union Government of India import and/or internal distribution of any commodity in short supply to stabilize prices and rationalize distribution.
3. The types of uncertainty which arise in the agriculture sector are the following:
  - i. Yield uncertainty
  - ii. Uncertainty as regards to the prices of the final products
  - iii. Tenurial uncertainty, and
  - iv. Uncertainty as to the likely prices and quality of inputs.
4. The main instruments of the agricultural price policy are the following:
  - i. **Support Prices:** It is one of the important instruments of the agricultural price policy. The Government announces Minimum Support Prices (MSP) for major farm products well in advance of the sowing season.
  - ii. **Procurement Prices:** Another instrument is in the area of procurement prices. It is regarding the fixation of procurement prices of major foodgrains. These prices form the basis for purchasing a part of the marketable surplus at below the market prices.

## NOTES

**iii. Public Distribution System:** The third one covers the public distribution system through the fair-price shops under the auspices of the government. These shops offer goods at issue prices fixed by the government. This is intended to safeguard the interest of low-income consumers, although there is no bar to anyone, including high-income consumers, to buy from these distribution depots.

**iv. Buffer-Stocks:** The fourth relates to the building up of buffer stocks. This is to meet emergencies and to mitigate seasonal and annual price fluctuations in prices.

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## 12.7 SUMMARY

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- The main agency providing foodgrains to the PDS is the Food Corporation of India (FCI) set up in 1965. The primary duty of the Corporation is to undertake the purchase, storage, movement, transport, distribution and sale of foodgrains and other foodstuffs.
- The State Trading Corporation (STC) was set-up by the Government in May 1956 incorporated under the Indian Companies Act, 1956. It was designed as the sole import-export agency as may be decided by the Government of India from time to time.
- The STC has developed a sound infrastructure for the development of exports through its 20 branches in India and 18 overseas offices and a large force of trained marketing personnel. Foreign offices provide market intelligence and can pursue the STC business matters with the various parties concerned.
- There are two major types of uncertainty which arises when the producer commits his resources to the production in the present and then waits for the outcome till sometime in the future.
- Another type of uncertainty that is quite conspicuous in agriculture is the tenurial uncertainty. We know that land is generally leased out to tenants. The tenant, as a farmer, does not know for how long he will be able to retain the land in his possession. He will, therefore, hesitate to make long-term improvements in land as he is not sure about earning sufficient additional returns from such improvement during the period of tenancy.
- Some economists, in order to be more comprehensive, have suggested six 'Ps' indicating uncertainties. These are: Price uncertainty, Production uncertainty, Production technology uncertainty, Political uncertainty, Personal uncertainty and People's uncertainty.

- The Agricultural Prices Commission was set-up in January 1965 to advise the Government on price policy of major agricultural commodities. To evolve a balanced and integrated price structure in the perspective of the overall needs of the economy and with due regard to the interests of the producer and the consumer.

*Role of FCI and State Agencies*

## NOTES

### 12.8 KEY WORDS

- **Political uncertainty:** It refers to the uncertain political conditions in the country. Under normal circumstances, this type of uncertainty may not be there.
- **Buffer stock:** It refers to a stock of a basic commodity acquired in a period of low or unstable prices and distributed in a period of high prices to stabilize the market.
- **Perfect competition:** It is a market form in which no producer or consumer has the power to influence prices in the market.

### 12.9 SELF ASSESSMENT QUESTIONS AND EXERCISES

#### Short-Answer Questions

1. Mention the significant achievements of the Food Corporation of India (FCI).
2. State the major weaknesses of the State Trading Corporation (STC).
3. Write short notes on the following:  
(a) Tenurial uncertainty (b) Uncertainty with regard to Input Prices/ Quality

#### Long-Answer Questions

1. Discuss the establishment, objectives and functioning of the State Trading Corporation (STC) in India.
2. Explain the main objectives of the agricultural price policy.
3. Discuss the functions of the Commission for Agricultural Cost and Prices (CACP).

### 12.10 FURTHER READINGS

Hanumantha Rao, C.H. 1965. *Agricultural Production Function, Costs and Returns in India*. Mumbai: Tata McGraw Hill.

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**BLOCK - IV**  
**AGRICULTURAL CREDIT**

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*Agricultural Credit and  
Finance*

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**UNIT 13 AGRICULTURAL CREDIT  
AND FINANCE**

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**NOTES**

**Structure**

- 13.0 Introduction
- 13.1 Objectives
- 13.2 Importance of Agriculture Finance
- 13.3 Need for Government Intervention
- 13.4 Answers to Check Your Progress Questions
- 13.5 Summary
- 13.6 Key Words
- 13.7 Self Assessment Questions and Exercises
- 13.8 Further Readings

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**13.0 INTRODUCTION**

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The agricultural credit policies designed and implemented in India are mainly supply driven through targeted ground level credit, interest subvention scheme and directed lending by way of regulatory prescription under Priority Sector Lending guidelines. These policies along with other policy interventions at the level of Government and RBI have yielded commendable results in the field of agricultural credit. However, agricultural sector still faces challenges such as lack of capital formation, regional disparity, dependence of farmers especially small and marginal farmers, tenant farmers, landless labourers and share croppers on non-institutional sources of credit at significantly higher rates, non-realization of the fair price for agricultural produce causing farmers' distress and farm loan waivers impacting credit culture and weakening state finances.

In this unit, you will study about the importance of agricultural finance and the need for government intervention in this field.

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**13.1 OBJECTIVES**

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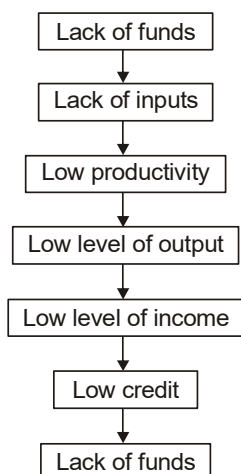
After going through this unit, you will be able to:

- Analyse the importance of agricultural finance
- State the classification of agricultural credit
- Discuss the role of government in agricultural credit

## 13.2 IMPORTANCE OF AGRICULTURE FINANCE

### NOTES

Agriculture is the backbone of the Indian economy; however, it is still at a backward stage. Most of the Indian farmers do not have adequate funds, thus, they are not able to use good quality seeds and fertilizers in their farms. Also, farming in India is viewed as a means of subsistence rather than as an enterprising venture. Thus, private investors do not invest money in this sector. Lack of funds gives rise to a vicious circle, which is shown in Figure 13.1.



*Fig. 8.1 Vicious Flowchart of Funds*

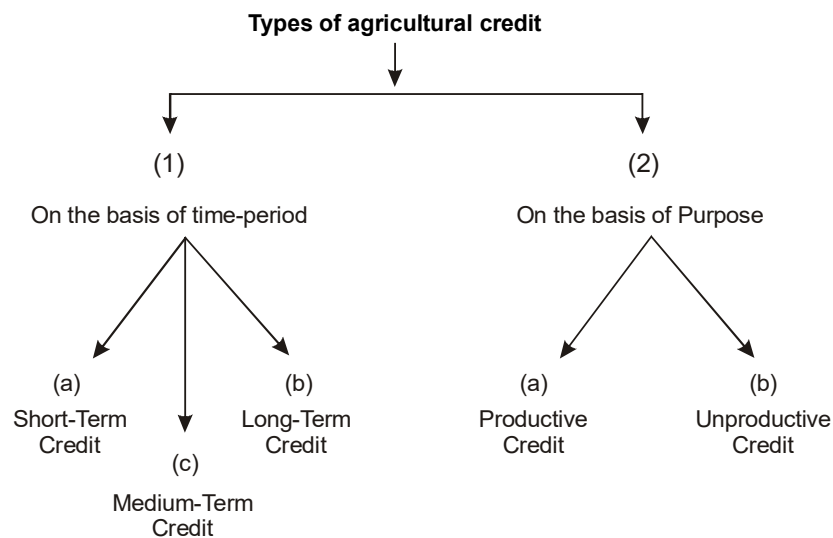
Therefore, agricultural credit is considered indispensable as agriculture cannot grow without it. A number of economists also believe that the availability of agricultural credit would emerge as the fulcrum of change for the Indian agriculture. Farmers might require credit for improving the agricultural production, repaying existing credit and adopting improved methods of production. Their credit needs can also be classified on the basis of time-period and purpose. The classification can be done as follows:

- **On the basis of time-period:** If time-period is taken as the basis of classification, then, credit needs of farmers can be classified into following types:
  - o **Short-term credit:** When farmers need credit for less than fifteen months for the purpose of cultivation or for meeting domestic expenses, they opt for short-term credit. Farmers are given this kind of credit for buying seeds, fertilizers, fodder for cattle, etc. They may also be given this kind of credit to support their families in those months when the crops are not adequate for this purpose. Such short-term loans are generally repaid after the harvest.



- o **Medium-term credit:** Farmers may also require funds for medium term ranging between fifteen months to five years for improving land, buying cattle and agricultural instruments. Repayment period of such loans varies according to the period of loan.
- o **Long-term credit:** When farmers need funds for longer duration of time for buying additional land, improving existing land, paying off old debts or purchasing costly agricultural machinery, they take long-term credit. The duration of such loans varies from five years to twenty years.
- **On the basis of purpose:** Farmers may require credit for different purposes. Thus, you can further classify credit requirements of farmers into following purposes:
  - o **Productive credit:** This type of credit is taken by farmers for buying seeds, fertilizers and implements, for paying taxes to the government and for making improvements on land. This type of credit helps farmers in their agricultural operations.
  - o **Unproductive credit:** Sometimes, farmers take credit for marriages, births, deaths, litigation etc. This type of credit is known as unproductive credit as it does not help farmers in the agricultural operations.

Figure 13.2 shows the various types of agricultural credits:



**Fig. 13.2** Types of Agricultural Credit

## NOTES

## NOTES

### Check Your Progress

1. What is the reason for private investors not investing money in the agricultural sector?
2. What are the reasons for which farmers take medium term credit?

## 13.3 NEED FOR GOVERNMENT INTERVENTION

The need for government intervention in the agricultural credit market is significant because this intervention leads to the upliftment of vulnerable sections of the society such as farmers and other destitute classes. The government generally intervenes in the agriculture market by providing guarantee to banks for loans and setting up credit institutions especially for agriculture. Further, assistance also includes extending subsidized credit to agricultural producers.

- 1. Credit Subsidies:** To make credit cheaper for agriculture farmers, the government provides credit at a preferential interest rate to the farmers and producers. Generally, this is also known as the credit subsidy. By providing credit subsidy to the agriculture producer, the fall in agricultural production and disruption 'below a long-run equilibrium' may be mitigated or reversed. Additionally, credit subsidies also act as a way of supporting agriculture without getting in conflict with their GATT agreements, as might be the case when they would use price supports.

State enterprises and production structures under liquidation or restructuring typically care less about repaying loans (as their debts are often regularly cancelled) their demand for credit may have a crowding-out effect on private farmers or enterprises facing hard budget constraints. In this way, the latter faces unfair competition from the former on the demand side of the credit market. Credit subsidies may mitigate this effect.

To provide credit subsidy the following points should be considered by the government:

- i. The government has to develop a credible mechanism to limit the duration of the programme for credit subsidy.
- ii. The government has to target the programmes of credit subsidies for the post-reform enterprises and send a target of the programme up to a certain extent to restrict the subsidies.
- iii. The government should also use financial institution machinery for channelizing the subsidies to reduce the burden of the administration

cost and ensure that the fund must go to the viable and desired enterprises to support and give impetus to agriculture growth.

- iv. Individuals receiving assistance should be able to demonstrate that the loan will be used for the intended purpose.

**2. Loan Guarantees:** The loan guarantee programme offered by the bank on behalf of the government should ensure that the objective of such investment programme in the long run must provide a solution to the agriculture producers for their financial requirement and provide motivation and much needed financial support to the agriculture entrepreneurs. In setting up loan guarantee programmes, it is important to prevent diminution of incentives for the agents involved as much as possible. Therefore, one should be careful to ensure that the borrower has to provide the first part of the collateral and is forced to repay as much as possible in case of default. The bank has to take its share of the risk to stimulate the bank to monitor and screen the loans sufficiently. Furthermore, the programme should allow several banks to participate, to induce competition. Finally, the government should limit its involvement in setting general simple and transparent rules, and should not be allowed to interfere with specific applications or actual loan decisions.

**3. Creation of Specialized Agricultural Credit Institutions:** Specialized credit institutions for agriculture can be found in different forms such as credit co-operatives, state-owned agricultural funds, mutual or development funds. These institutions have different characteristics affecting their efficiency, many of which are specific to their individual situation. The most important advantages from the creation of specialized agricultural credit institutions are lower transaction, monitoring and verification cost through greater specialist knowledge of relevant agricultural activities.

The inception of agriculture intuitions like NABARD and co-operative societies development play an important role in channelizing agriculture finance and inclusion of most vulnerable agriculture borrower. This has mitigated the gap between the lender and borrower and has given a formal market for making such transactions. Further, participation of the commercial banks in agriculture finance either directly or indirectly may lead to strengthening of trade and commerce in the agricultural sector and provide more opportunities to farmers, artisans, handicraftsmen and small entrepreneurs.

Initially, the commercial banks of our country have played a marginal role in advancing rural credit. In 1950-51, commercial banks supplied only 1 per cent of the total agricultural credit of the country. But after nationalization of banks in

## NOTES

## NOTES

1969, these commercial banks have been advancing, directly and indirectly, financial assistance and short-term and medium-term loans to the rural sector. With the introduction of village adoption scheme and the service area approach, the commercial banks started to consider the needs of the agriculturists. The commercial banks again protected the small and marginal farmers from the clutches of village moneylenders by sponsoring Regional Rural Banks (RRBs) in different states of the country.

To increase credit flow to the rural sector, commercial banks were advised by the RBI to provide at least 10 per cent of their net bank credit or 25 per cent of their priority sector advances to weaker sections comprising small and marginal farmers, landless labourers, tenant farmers and sharecroppers, artisans, village and cottage industries and beneficiaries of Integrated Rural Development Programme, Scheduled Castes and Scheduled Tribes and beneficiaries of Differential Rate of Interest (DRI) Scheme.

Finally, over the period, the role of institutional finance in the agriculture sector is increasing and providing more opportunities in this sector. The Kisan Credit Card and other agriculture outreach programmes to the farming community can be successful only by the inclusion of the agricultural sector and financial institutions play a crucial role in achieving this objective. The RRBs, NABARD and cooperative societies are working together in association with the Reserve Bank of India to achieve the financial sustainability and liquidity in the agricultural sector. This would enhance the flow of liquidity in this sector and use of technology and enhance the productivity and revenue to farmers.

The basic and important philosophy of financial institutions is to ensure perfect coordination among all the agencies operating in the rural areas with the common objective of meeting the credit needs of the rural economic activities along with the borrowers belonging to the weaker sections of the society.

### Check Your Progress

3. What are the essential points to be considered by the government while developing the credit subsidy system?
4. Mention one significant role played by the creation of specialized agricultural credit institutions.

## 13.4 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Since farming in India is viewed as a means of subsistence rather than an enterprising venture, private investors do not invest money in this sector.

2. Farmers take medium term credit for improving land, and buying cattle and agricultural instruments.
3. The essential points to be considered by the government while developing the credit subsidy system are the following:
  - The government has to develop a credible mechanism to limit the duration of the programme for credit subsidy.
  - The government has to target the programmes of credit subsidies for the post-reform enterprises and send a target of the programme up to a certain extent to restrict the subsidies.
  - The government should also use financial institution machinery for channelizing the subsidies to reduce the burden of the administration cost and ensure that the fund must go to the viable and desired enterprises to support and give impetus to agriculture growth.
  - Individuals receiving assistance should be able to demonstrate that the loan will be used for the intended purpose.
4. The RRBs, NABARD and cooperative societies are working together in association with the Reserve Bank of India to achieve the financial sustainability and liquidity in the agricultural sector. This would enhance the flow of liquidity in this sector and use of technology and enhance the productivity and revenue to farmers.

## NOTES

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### 13.5 SUMMARY

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- Agriculture is the backbone of the Indian economy; however, it is still at a backward stage. Most of the Indian farmers do not have adequate funds, thus, they are not able to use good quality seeds and fertilizers in their farms.
- Farmers might require credit for improving the agricultural production, repaying existing credit and adopting improved methods of production. Their credit needs can also be classified on the basis of time-period and purpose.
- The need for government intervention in the agricultural credit market is significant because this intervention leads to the upliftment of vulnerable sections of the society such as farmers and other destitute classes.
- The loan guarantee programme offered by the bank on behalf of the government should ensure that the objective of such investment programme in the long run must provide a solution to the agriculture producers for their

## NOTES

financial requirement and provide motivation and much needed financial support to the agriculture entrepreneurs.

- The commercial banks again protected the small and marginal farmers from the clutches of village moneylenders by sponsoring Regional Rural Banks (RRBs) in different states of the country.
- The basic and important philosophy of financial institutions is to ensure perfect coordination among all the agencies operating in the rural areas with the common objective of meeting the credit needs of the rural economic activities along with the borrowers belonging to the weaker sections of the society.

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### 13.6 KEY WORDS

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- **Productive credit:** This type of credit is taken by farmers for buying seeds, fertilizers and implements, for paying taxes to the government and for making improvements on land. This type of credit helps farmers in their agricultural operations.
- **Commercial bank:** This bank acts as a financial institution that offers basic investment products like a savings account, current account and other facilities to individuals and corporate houses.
- **Differential Rate of Interest (DRI) Scheme:** This scheme was introduced in India in the year 1972 by the public sector banks to extend bank credit to the weaker sections at concessional rates of interest.

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### 13.7 SELF ASSESSMENT QUESTIONS AND EXERCISES

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#### Short-Answer Questions

1. State the importance of agricultural finance in India.
2. Write a short note on the classification of credit needs of farmers in India.

#### Long-Answer Questions

1. Why is government intervention in agricultural finance significant?
2. Discuss the steps taken by the Indian government in the agricultural credit market.

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## 13.8 FURTHER READINGS

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*Agricultural Credit and  
Finance*

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## NOTES

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## UNIT 14 AGRICULTURAL CREDIT SYSTEM IN INDIA

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### NOTES

#### Structure

- 14.0 Introduction
- 14.1 Objectives
- 14.2 Role of NABARD, RRBs and Cooperatives
  - 14.2.1 National Bank for Agricultural and Rural Development
  - 14.2.2 Regional Rural Banks (RRBs)
  - 14.2.3 Co-operative Movement in India
- 14.3 Role of Micro Finance, SHGS and NGOs
  - 14.3.1 Micro Finance through Self Help Groups
  - 14.3.2 Micro Finance Institutions
  - 14.3.3 Agriculture Insurance in India
- 14.4 Problems of Capital Formation
- 14.5 Answers to Check Your Progress Questions
- 14.6 Summary
- 14.7 Key Words
- 14.8 Self Assessment Questions and Exercises
- 14.9 Further Readings

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### 14.0 INTRODUCTION

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For embarking on any enterprise, the basic requirement is that of finance. Similarly, in agriculture, finance holds a very significant place. More so, when the activity is taken up by a large part of the population who fall into the weaker sections of the society. Further, the requirement for finance is not just limited to the agricultural uses, they even expand to the non-productive uses. This is where the concept of agricultural credit comes in. In this unit, you will learn about the meaning and importance of agricultural finance; various sources of credit; the functions and status of NABARD, cooperatives, Regional Rural Banks, Self Help Groups, Micro finance institutions, NGOs, insurance; and about the problem of capital formation.

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### 14.1 OBJECTIVES

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After going through this unit, you will be able to:

- Examine the role and functions of NABARD
- Analyse the significant role of Regional Rural Banks
- Discuss the benefits provided by Co-operative societies in India
- List the problems faced by cooperative societies
- State the National Agricultural Insurance Scheme (NAIS)
- Explain the remedies to the problem of agricultural indebtedness



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## **14.2 ROLE OF NABARD, RRBS AND COOPERATIVES**

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We will now look at some of the important sources of rural credit.

### **14.2.1 National Bank for Agricultural and Rural Development**

On the recommendation of Shivaraman Committee, appointed by the Reserve Bank of India in March, 1979, to study the problems related to agricultural credit, National Bank for Agriculture and Rural Development (NABARD) was established on 12 July 1982. It was established as an apex bank for the agricultural credit. This was expected to play an important role in the agricultural and rural development. This apex development bank was established for the promotion of agriculture, small scale industries, cottage and village industries and other allied economic activities in rural areas. Rural areas cover all villages, irrespective of the size of population and also towns, with a population not exceeding 10,000. NABARD took over the functions of the following departments of the Reserve Bank of India:

- Agriculture Credit Department
- Rural Planning and Credit Cell
- Agricultural Re-finance and Development Corporation

### **Principal activities of NABARD**

NABARD focusses on the following activities:

- It plays the role of an apex institution in respect of all matters relating to policy and planning and operational aspects relating to promotion of credit for agriculture, small scale industries, cottage and village industries, handicrafts and other allied economic activities in the rural areas.
- It serves as a re-financing institution for providing long-term and short-term credit for promotion of activities in rural areas.

### **Management of NABARD**

The Government of India has entrusted the management of the NABARD to a Board of Directors. This Board consists of the following:

- A Chairman
- A Managing Director
- Three directors from among the directors of the RBI
- Three directors from the officials of the Government of India
- Two directors from among the experts in rural economics and rural development
- Two directors from among the officials of State Governments

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- Three directors with the experience in the working of co-operative and commercial banking

### Functions of NABARD

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NABARD performs the following functions:

- **Credit functions:** Following are the principal credit functions of NABARD:
  - o **Re-finance facility:** NABARD offers re-finance facility (by way of short-term credit) to co-operative banks, sectoral banks and other financial institutions. By doing it, NABARD seeks to promote the following:
    - (i) Marketing of agricultural produce
    - (ii) Distribution of agricultural inputs to the farmers
    - (iii) Production and marketing activities of cottage and small scale industries
  - o **Medium-term credit:** NABARD offers medium-term credit (for a period ranging between 1½–7 years) to the following:
    - (i) State co-operative banks
    - (ii) Regional rural banks
  - o **Long-term credit:** NABARD offers long period credit (for a period not exceeding twenty-five years) to the following:
    - (i) State co-operative banks
    - (ii) RRBs
    - (iii) Land development banks
    - (iv) Commercial banks
  - o **Conversion facilities:** It offers conversion facility to state cooperative banks and RRBs for period not exceeding seven years under conditions of drought, famine or other natural calamities.
  - o **Credit to state governments:** It provides credit to state governments for periods not exceeding twenty years to enable them to subscribe directly or indirectly to the share capital of co-operative credit societies.
  - o **Share capital:** NABARD subscribes to share capital or invests in securities of any institution concerned with agricultural and rural development.
- **Regulatory functions:** Following are the principal regulatory functions of NABARD:
  - o The Banking Regulation Act, 1949 empowers NABARD to undertake the inspection of co operative societies other than primary co-operative societies and RRBs

- o Any RRB or a co-operative society seeking permission to open a branch will have to forward its application to the Reserve Bank through NABARD.
- o The RRBs and the co-operative banks submitting their returns to the Reserve Bank are expected to furnish copies of such returns to NABARD.
- o The NABARD has been granted powers to call for any information or statement from the co-operative banks and the RRBs.
- **Development functions:** NABARD undertakes various development functions.

It formulates the following:

- o Credit plans
- o Builds institutions
- o Promotes research and technology
- o Introduces innovations in credit delivery mechanisms
- o Focusses on skill-upgradation of beneficiaries and client banks

NABARD co-ordinates the operations of the following:

- o Rural credit agencies
- o Develops expertise to deal with agricultural and rural problems
- o Assists government, Reserve Bank and other institutions in their rural development efforts

It provides facilities for training and research, assists the state governments to enable them to contribute to the share capital of the eligible institutions. In order to upgrade the technical skill and competence of the personnel engaged in agricultural and rural development, NABARD undertakes various training programmes as well.

### **Capital and resources of NABARD**

Initially, the paid-up capital of NABARD was ₹ 100 crore and authorized capital was ₹ 500 crore. The paid-up capital was initially contributed by the RBI and the Central Government. The paid-up capital of NABARD was raised from ₹ 100 crore to ₹ 500 crore. In 1999, it was raised to ₹ 2,000 crore. NABARD draws funds from the Government of India, the World Bank and other agencies, and also raises fund from the market. With these contributions the effective capital base of NABARD at the end of March 2000, rose to ₹ 6,882 crore. The authorised capital of NABARD till 2020 was ₹ 30,000 crore Major resources of NABARD are as follows:

- **Share capital:** As mentioned above, the paid-up capital of NABRD has been gradually raised from ₹ 100 crore to ₹ 1000 crore and has been further enhanced to ₹ 2000 crore. The paid-up capital as on 31 March 2020 was ₹ 14,080 crore

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- **National Rural Credit Fund:** This fund has been set up under Section 42 of the NABARD and is credited with the contributions made by RBI and the Government of India from time to time. The amount in this fund is applied by NABARD to provide financial assistance by way of loans and advances for various purposes.
- **National Rural Credit (Stabilization) Fund:** This fund is also credited with contributions from the RBI and the Central Government. The money credited to this fund is utilized for granting assistance to state co-operative banks, RRBs or other financial institutions when they require assistance by way of loans and advances up to seven years, due to drought, famine or other calamities, military operations or enemy action.
- **Rural Infrastructure Development Fund:** This fund was created for facilitating quicker completion of on-going rural-infrastructure projects and commercial banks, which fail to meet the target for agricultural lending under the priority sectors.
- **Borrowing from Reserve Bank:** The Reserve Bank of India provides General Lines of Credit (GLC) to NABARD to facilitate the re-finance of seasonal agricultural operations and off-farm credit.
- **Bonds and Debentures:** NABARD raises funds through market borrowings by issue of bonds and debentures.
- **Deposits:** Most of the deposits have been made by private banks on account of priority sector lending.
- **Government of India and World Bank:** As mentioned above, the NABARD draws fund from the Government of India and the World Bank and IDA.

### Performance and Achievements of NABARD

One may make following observations in this regard:

- **Resource mobilization:** NABARD mobilized resources amounting to ₹ 6,282 crore in 2001–2002, which is indeed very credible. The contribution of National Rural Credit to these resources amounted to ₹ 1,202 crore and the Rural Infrastructure Development Fund (RIDF) deposits contributed to about one third (₹ 2,474 crore) of the total resources. As on March 2020, the contributions from NRC and RIDF stood at ₹ 16,090 crore and ₹ 1,30,442 crore.
- **Re-finance:** It provides re-finance facilities to state governments and regional rural banks. The disbursement can be split in two parts:
  - o **Purpose-wise disbursement:** The NABARD disburses credit mainly for the following purposes:
    - (i) Minor irrigation
    - (ii) Land development

- (iii) Farm mechanization
- (iv) Plantation
- (v) Horticulture
- (vi) Poultry farming
- (vii) Sheep breeding
- (viii) Fisheries
- (ix) Dairy development
- (x) Storage
- (xi) Market yards

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The purpose-wise disbursement of investment credit by NABARD (re-finance) reveals that farm mechanization operations accounted for the largest share of ₹ 1,099 crore (28 per cent) in total investment credit in 2002.

For the FY 2019-20, among the major purposes, SHGs accounted for one-third and off-farm development/MSME sector accounted for a quarter of total LT Refinance disbursement during 2019-20.

- o **Region-wise disbursement:** NABARD has divided the country in six regions, viz., northern, north-eastern, eastern, central, western and southern. The regional distribution of re-finance by NABARD reveals that the southern region accounted for the highest share of total disbursements (36.9 per cent) in 2002 followed by the northern region (22.7 per cent), then the central region (17.9 per cent) and the western region (14.5 per cent).

For the FY 2019-20, the Southern region accounted for the highest share of 41 % followed by Western region at 19 per cent.

- **Rural Infrastructure Development Fund (RIDF):** The Rural Infrastructure Development Fund (RIDF) was initially set up with an amount of ₹ 2,000 crore in 1995–1996. Now total corpus of the fund has increased to ₹ 18,000 crore. The main objective of this fund is to help completion of various types of rural infrastructure projects (like irrigation, roads and bridges) undertaken by the state governments and state corporations. Disbursement of ₹ 13,042 crore had been made by the end of 2002. The Government of India set-up a new RIDF Fund with budget every year (since 1995–1996). So far seven funds have been set-up during the last six years with total corpus funds of ₹ 23,000 crore.

The disbursements and repayments under RIDF during the 2019-20 stood at ₹ 26,266 crore and ₹ 20,782 crore respectively.

- **Micro finance:** This focusses on access of rural poor to formal banking services through self help groups (SHGs). A Micro Finance Development Fund in NABARD with a start-up capital of ₹ 100 crore was announced through Union Budget in 2000–2001.

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- **Kisan Credit Card Scheme:** This scheme was introduced in 1998–1999 to facilitate short-term credit to farmers. It is popular among both the farmers and the bankers. Farmers have the flexibility of availability production credit avoiding procedural delays. For bankers, the need for repeated processing of credit application is avoided.
- **Agricultural Development Finance Companies:** NABARD took the initiative in establishing state level agricultural development finance companies. The objective of these companies is to strengthen the flow of credit to hi-tech/ high value agricultural operations and associated infrastructure. These companies have been set-up in Andhra Pradesh, Tamil Nadu and Karnataka. The equity participation between public and private sectors is to be in the ratio of 45: 55.
- **Promotional and developmental measures:** NABARD also undertakes several promotional and developmental measures for qualitative improvement of lending in the non-farm sector. The promotional schemes so far introduced/ supported with grant/assistance include training cum production centres, artisan guilds, rural entrepreneurship development programmes and other training programmes. NABARD also has a scheme to link self-help groups (SHGs) with banks with 100 per cent re-finance facility.
- **Credit Monitoring Arrangement:** NABARD (in consultation with RBI) has replaced Credit Authorization Scheme (CAS) with Credit Monitoring Arrangement (CMA). It has been done with a view to provide cooperative banks greater freedom and discretion. The idea is to create a liberalized and competitive banking environment. However, banks are required to adhere to the exposure norms. They must satisfy themselves about the technical feasibility and financial viability of the credit proposals.
- **Re-finance under SGSY:** NABARD has engaged itself in the implementation of Swarnajanti Gram Swarozgar Yojna (SGSY). It has issued operational instructions to RBIs and Cooperative Banks. Banks have been advised to evolve suitable norms for grading SGSY groups at different stages of financing on the illustrative parameters indicated by NABARD.

### 14.2.2 Regional Rural Banks (RRBs)

On the birth anniversary of Mahatma Gandhi, 2 October 1975, Regional Rural Banks were established with a view to increasing the availability of rural credit. Among the various institutional agencies engaged in rural credit, **Regional Rural Banks (RRBs)** play a significant role. These are specially designed financial institutions working under the guidance of NABARD. They are spread across rural areas with a wide network of branches catering to credit needs of the farmers and other segments of the rural economy.

## **Objectives**

The main need and objective of the RRBs is to provide credit and related facilities to the small and marginal farmers, agricultural labourers and artisans, who had, not been adequately served by the existing credit institutions.

## **Organization**

The RRBs are promoted by 'Sponsor banks', which are usually public sector banks. The steering committee on RRBs identifies the districts requiring these banks. Later, the Central Government sets up RRBs with the consultation of the state government and the sponsor bank. Each RRB operates within local limits as specified by the Government. The bank can establish its branches at any place within the notified area.

## **Capital**

The authorized capital of an RRB is ₹ 5 crore, which may be increased or reduced by the Government but not below its paid up capital of ₹ 25 lakh. Of this, 50 per cent is subscribed by the Central Government, 15 per cent by the State Government and 35 per cent by the sponsor bank. At present, the subscription ratio to RRBs has been fixed at 60: 20: 20 for the Central Government, State Government and the sponsor bank, respectively.

## **Management resources**

Each RRB is managed by a Board of Directors. It includes a general superintendent and nine members as Board of Directors. The Central Government nominates three directors, the State Government has two directors and the sponsor bank nominates three directors. The chairman, usually an officer of the sponsor bank, is appointed by the Central Government. The Board of Directors is required to act on business principles and in accordance with the directives and guidelines issued by the Reserve Bank. At the state level, State Level Coordination Committees have also been formed to have uniformity of approach of different RRBs.

## **Resources**

RRBs generate their resources by way of following:

- Share capital
- Deposits from the public
- Borrowing from sponsor banks
- Re-finance from NABARD

The Reserve Bank of India puts RRB at par with the co-operative banks, offering refinance at 2 per cent below the bank rate. Like commercial banks, the RRBs, have been made eligible for accommodation against a mere declaration of eligible loans and advances by them. Further, RRBs have also been granted the

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status of scheduled banks by the Reserve Bank of India. They are allowed to maintain cash reserves at the rate of 3 per cent of their demand and time liabilities till December, 2002.

The RRBs are allowed to offer 1½ per cent additional rate of interest on their deposits over the rate offered by commercial banks. The deposits of the banks are also insured by Deposit Insurance and Credit Guarantee Corporation of India Ltd. This is to protect the interest of the depositors.

### Functions

Functions of RRBs are broadly categorized as follows:

- **Functions related to agricultural activities:** In the context of agricultural activities, RRBs performs the following functions:
  - o RRBs grant loans and advances to small and marginal farmers and agricultural labourers. The loans and advance are granted to individual farmers or groups of farmers or to co-operative societies. It is done to ensure that the loans are invested in productive activities so that there is value addition and generation of employment. The agricultural marketing societies (receiving such loans) are expected to sell the farmers produce at the right time, right place and the right price. By offering loans to the small and marginal farmers, RRBs play a crucial role in eliminating the menace of moneylenders and land landlords who would desire to keep the borrowers in a state of perceptual dependence and vulnerability.
- **Doorstep banking service:** RRBs provide banking services at the doorsteps of the rural people, particularly in those areas that are not served by the commercial banks. The RRBs mobilize rural saving and accept deposits. These are channelized into productive activities. This function of the RRBs motivates rural people to save, avoiding conspicuous consumption.
- **Functions related to non-agricultural activities:** RRBs perform the following functions relating to non-agricultural activities:
  - o **Loans to artisans:** RRBs provide loans to artisans to encourage the production of the artistic and related goods. We know, artisans in the rural areas have extremely meager resources and barely manage to make a living by selling their handmade artistic goods. They do have an enterprising spirit, but it remains dormant owing to the lack of funds. By offering easy and cheap credit, the RRBs enable the artisans and skilled workers to make their both ends meet by selling their artistic goods in the market. If these fellows get a financial help, they will be able to buy raw material and other required material for the production of their goods and thus they can improve the quality of their goods. The sale of the improved quality of goods can provide them with good income and thus they can raise their standard of living.



- o **Loans to small entrepreneurs:** There are a large number of small entrepreneurs in the villages, sub-urban areas and small towns who are engaged in retail trade, commerce and other productive activities. These entrepreneurs have insufficient means to carry on their business activities.

The RRBs offer loans to them at a very low rate of interest. It is to help them buy raw materials and spare parts for the maintenance of their fixed assets. The RRBs also grant loans to self-employed persons enabling them to enhance their income for a reasonable standard of living.

- **Consumer loans:** RRBs offer consumer loans to weaker sections including small and marginal farmers, Scheduled Castes, Scheduled Tribes and other borrowers of small means. This is to ensure that weaker sections of the society do not suffer deprivation in essentials of life.
- **Poverty alleviation programme:** RRBs are expected to play a pivotal role in bringing people below poverty line into the mainstream life. As a part of the national agenda on economic reforms, RRBs are expected to launch such programmes that strive to lift the poor out of poverty. Generation of employment opportunities at the grass root level is to be the central theme of the poverty alleviation programmes.

Overtime, banking functions of RRBs have tended to expand. They have also started giving loans and advances for the purchase of consumer durables and other purposes, on the security of gold ornaments. They have also been permitted to issue guarantees on behalf of their clients. These banks can also issue travellers cheques as agents of their sponsoring bank and also provide locker facilities. They can purchase drafts and cheques upto the value of ₹ 25,000 and ₹ 1, 00,000, respectively per customer and per branch.

### **14.2.3 Co-operative Movement in India**

As you have learnt in an earlier unit, the co-operative movement has been in existence for over a century. According to many critics, the movement is utter failure and should be scrapped. The movement has done nothing to abolish poverty of the rural masses. Nor has it contributed to increase agricultural production, to establish better marketing conditions, better living, etc. It has not even reduced the rapacious money-lender from the rural scene.

The utter insignificance of the co-operative movement was indicated by the fact that in 1954 (exactly after fifty years of its existence) the co-operative institutions supplied just three per cent of the credit requirements of the farmers. The All-India Rural Credit Survey Committee (1954) stated that ‘Co-operation has failed, but co-operation must succeed.’

Since then, with the Government and the Reserve Bank taking active interest, the cooperative movement has made great progress. The progress in the last four decades is much more than the progress that was achieved in the first fifty years of its existence.

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### Benefits

Co-operative societies have provided credit to the farmers at a cheap rate. Since 1954, the Co-operative credit societies are meeting the requirements of farmers increasingly. More than 60 per cent of the credit needs of farmers are met by the co-operative societies. The monopoly of the moneylenders, landlords etc., is being broken in the villages.

While at one time the money-lenders provided more than 70 per cent of the farmer's credit needs, they are now providing less than 35 per cent. In course of time, therefore, co-operative credit would become so significant that the village money-lenders will have no role to play in rural finance.

The co-operative societies have led to the use of better farming methods, such as the use of improved seeds, manures, etc. The marketing and processing societies have helped members to buy their requirements cheaply and sell their agricultural produce at good prices. It has also provided good storage facilities to the farmers.

Co-operative societies have also helped in improving life in rural areas. They have educated the farmers so that the latter could give up many of their bad habits like gambling, drinking, etc. They have attempted to remove undesirable social customs like reckless spending during marriage, religious ceremonies, etc. They have discouraged farmers from going to the courts and indulging in costly litigation; they have attempted to solve disputes at the village level itself. In other words, they have been attempting to improve the farmers socially and morally.

The non-credit societies, like the housing co-operative societies, the consumer's co-operative societies, etc., have helped their members to raise their economic conditions and have saved them from the exploitation of powerful groups. For instance, in many urban areas, housing co-operatives have enabled middle income groups to secure plots of land and also construct their own houses. Consumer co-operatives have done great service to the community by helping to distribute goods in short supply and in selling goods at reasonable prices. In many places they have been instrumental in preventing the private shopkeepers from taking advantage of supply shortages and charging exorbitant prices. Likewise, societies meant to help artisans like handloom weavers may have helped their members with finance and marketing facilities.

The rural co-operatives have played a significant role in areas of credit, agricultural production, agricultural processing and marketing. The guiding principles of co-operatives are voluntary and have open membership, democratic control and equitable distribution of profit and utilization of resources. The present thrust of the movement has been to build a democratically vibrant, economically viable and self-reliant co-operative movement in India.

## Weaknesses of the Movement

*Agricultural Credit  
System in India*

There are many reasons for the painfully slow growth of the movement in the first fifty years of its existence. The All India Rural Credit Survey Committee as well as many individuals and committees have brought out the various weaknesses of the movement in India and have suggested methods for improving and reorganizing the movement.

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- **Lack of spontaneity:** The co-operative movement in India did not spring from the people themselves. The movement was not voluntary, and people did not come forward to organize societies to satisfy their needs. On the other hand, the movement took the form of a government department. The villagers among whom the credit societies were started generally thought of the societies as government lending agencies. The government officials who ran the movement were ignorant of the ideals of co-operation. They were neither properly trained, nor were they aware of the needs of the farmers.

- **Lack of funds:** A basic weakness of the co-operative movement was the lack of funds. It was felt that the members themselves should save and deposit their savings and thus contribute a large share to the working capital of the societies.

The central and the state co-operative credit societies could not attract as much deposits from the general public as was anticipated. This is the situation even now. The Reserve Bank was willing to lend to the co-operative banks, and at concessional rates, but even this facility could not be taken advantage of by the state co-operative banks. Lack of funds was one of the basic weaknesses of the movement.

- **Loans for productive purposes only:** The co-operative credit societies did not help the farmers in meeting all their credit requirements. They gave loans only for agricultural operations but the farmers required loans to meet many of their other requirements as well. For these purposes, the farmers had to depend upon the money-lenders. In other words, the co-operative credit societies should have met all the requirements of the farmers; otherwise, they would not receive full loyalty of the farmers.
- **Provision of credit only:** The co-operative movement failed to appreciate the organic connection between credit, marketing and processing. As a result, the cooperative societies provided loans to the farmers but did not help the latter in any other way. In certain areas different societies were started for different purposes. What was really needed was a co-operative society that would meet all the needs of the farmers and keep in continuous touch with them throughout the year. The failure to provide credit, marketing, processing, better farming, etc., to the farmers was one of the basic factors responsible for the weakness of the movement in India.

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- **Competition from private agencies:** From the very beginning, the co-operative movement met with competition from powerful vested interests. In villages, the money lenders and traders worked for the failure of the village societies. In the urban areas, consumer societies faced bitter opposition and hostility of traders and speculators. But such opposition to the co-operative movement was not anything unique to India; such was the experience of other countries as well. But on account of the financial weakness of the movement in India, co-operation could not make much headway in the face of powerful competition.
- **Lack of co-operation on the part of the people:** In India, people have been largely illiterate, ignorant and extremely conservative. For one thing, most of them did not understand the real meaning and objective of co-operation. For another, the principle of unlimited liability that was the basis of the village credit societies prevented the better farmers to join the movement. Co-operation cannot succeed unless there is willing and complete co-operation from the people.
- **Defective management and leadership:** The failure and liquidation of many societies in rural areas was directly due to the defective management and leadership. As mentioned earlier, the village economy was dominated by the landlords. The small farmers owed blind allegiance to the landlords. But these landlords did not care much about the success of the co-operative movement. Nor did they take genuine interest in promoting the welfare of the farmers. Besides, the work of the societies suffered from nepotism, favouritism and partiality. For instance, loans and other assistance flowed easily to rich farmers and to the relatives and friends of the office-bearers. The needy and the poor failed to get any assistance. Moreover, the office bearers were not strict in getting repayments from those in whom they were interested. In general, the management was weak and inefficient.
- **The attitude of the government:** The government was correct in encouraging the movement in all possible ways. The mistake it made was to convert cooperatives into a government department with all the rigidities and short sightedness associated with a government department. The tendency was to officialize the movement too much and leave little to private initiative. Moreover, the Government put more emphasis in quickening the pace of the movement instead of consolidating it. Government did not take adequate interest in improving the financial strength of the societies, particularly the village primary credit societies.
- **The nature of Indian rural society:** Conditions in Indian rural society did not promote co operation among people. The average Indian farmer is

illiterate and ignorant and has not been able to understand the significance and utility of cooperation. Besides, rural society is riddled with caste spirit, religious feelings and other conditions that hamper the growth of the co-operative spirit and of the cooperative movement. To a large extent, these conditions prevail even now.

#### **Development of Different Types of Societies**

Indian planners considered co-operation as an instrument of economic development of the disadvantaged, particularly in the rural areas. They described a village Panchayat, a village co-operative and a village school, as a group of institutions on the basis of which you can build a self-reliant and just economic and social order.

The basic aim of starting a co-operative movement in India was to provide agriculturists funds for agricultural operations at low rates of interest and to protect the poor farmers from the grip of moneylenders.

#### **Primary Agricultural Credit Society**

A co-operative credit society also known as the **Primary Agricultural Credit Society (PACS)** is generally started with ten or more persons. These people generally belonged to one village. The cost of each share of this society is generally nominal so that even the poorest farmer can become a member. Primary Agricultural credit societies (PACs) are at the grassroots level of the short term co-operative credit structure. These societies deal directly with farmer—and they also undertake distribution as well as marketing functions.

The society's management is under the control of an elected body that consists of President, Secretary and a Treasurer. The management is generally honorary—the only member who is paid being the accountant.

This society usually gives loans for short periods, normally one year. These are given for carrying out the agricultural operations and the rate of interests is generally quite low. The profits are not divided but are instead used for the village's welfare.

The value of PACs has been increasing continuously. In 1950–1951, it advanced loans worth ₹ 23 crores and it rose to ₹ 200 crores in 1960–1961 and to ₹ 34,520 crores in 2000–2001. As of 2018, PACs have advanced loans worth ₹ 2,07,322 crore. The PACs have stepped up their advances to the weaker sections, particularly the small and marginal farmers. This progress has been quite spectacular but not adequate considering the demand for finance from farmers. However, 'the primary credit society has continued to remain the weakest link in the entire co-operative structure.'

#### **Restructuring of PACS**

In the past few decades, the PACS have stepped up their advances to the weaker sections particularly the small and marginal farmers. This progress has been quite

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spectacular but not adequate considering the demand for finance from farmers. However, the primary credit society has continued to remain the weakest link in the entire cooperative structure.

Considerable attention was given during the past few decades to build the PACS into strong institutions. Such a structure, close to the farmers, is very essential for disbursing rural credit, particularly to small farmers. A programme was introduced by the Government and RBI to reorganize and revitalize the primary agricultural credit societies. It was completed in Rajasthan, Orissa, Madhya Pradesh, Kerala, Tamil Nadu and Gujarat. In other states, it did not make much headway. The number of PACSs had come down from 2, 12, 000 in 1960–1960 to 1,61,000 in 1970–1971 and 92,000 in 1999–2000. And as of 2018, there are around 95,238 PACS. According to estimates, there are nearly one lakh PACS with membership of ten crore farmers.

Most of the PACS are dependent on the finance provided by Central Cooperative Bank (CCBs). In case, the CCBs are weak, the PACS are starved of finance, which affects the expansion of credit functions of PACS. As at the end of March 2002, the loans outstanding for PACS were over ₹ 32,520 and as of 2018, the amount.

### ***Financial strength of PACS***

In order to make all primary agricultural societies workable and to ensure they help rural areas the Reserve Bank of India, along with state government started PACS. The main purpose behind it was to correct regional imbalances in co-operative development. A lot of steps were taken to support non-viable societies with farmers' service societies or large sized multi-purpose societies. These efforts were encouraged by giving bigger funds to weaker societies to cancel their losses, bad debts and over dues. The programme of re-organization of PACS has been under implementation for the last two decades and is almost completed in all states except Gujarat, Maharashtra and Jammu & Kashmir.

### ***PACS and weaker sections***

The basic objective of the co-operative development programmes is ensuring that the benefits of co-operative activities flow increasingly to weaker sections. These sections include Scheduled Castes and Scheduled Tribes. The Government tries to achieve this by expanding the membership of the weaker sections in the existing PACSs and ensuring larger flow of funds and services to them. In the tribal areas, large sized multi-purpose societies are being organized for the benefit of the tribal.

### ***PACS and commercial banks***

The commercial banks in India introduced in 1970 a scheme of financing PACS, through which the funds of the commercial banks were being made available to

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PACS. This scheme came in handy to commercial banks, which could use PACS for disbursing agricultural loans and thus find a way out of the serious problem of not having close contacts with farmers through their own branches and field staff. The scheme, however, has not been as successful as was anticipated. Firstly, the two systems with two unrelated cultures – one commercial and the other co-operative – could not be linked effectively.

Difficulties have arisen from this basic incompatibility. Secondly, state co-operative banks as well as central co-operative banks have not liked successful PACS being taken away from their fold by the commercial banks. However, a good deal of scope for coordination exists between PACS and the branches of commercial banks in rural areas.

- The rural branches of commercial banks can assist such members of the PACS who are eligible for loans but who are unable to get finance from PACS for lack of funds.
- They can also help the PACS with advice on management, e.g., proper maintenance of books of accounts, accounting procedures, etc.
- The PACS, in their turn, can help commercial bank branches to identify eligible borrowers and to recover loans.

### ***Shortcoming of PACS***

The co-operative credit system makes credit available to the farmers at convenient distances and has intimate knowledge of the local conditions and problems. But it is organizationally and financially weak and hence, in practice, its ability to support credit to the agricultural sector is considerably limited. The All India Rural Credit Review Committee brought out the following weaknesses of the primary credit societies:

- Co-operative credit still forms a small portion of the total borrowings of the farmers.
- Tenants and small farmers find it difficult to satisfy their need for funds fully from PACS alone.
- Most primary credit societies are weak and are unable to meet the production oriented credit need of farmers fully.
- PACS have not been able to ensure adequate and timely credit for the borrowing farmers.

### **District Central Co-operative Banks**

In 2018, there were about 363 district central co-operative banks. These are federations of primary credit societies in particular areas that normally extend to the whole district. These banks have some private individuals as shareholders who provide both finance and management. Their main task is lending to village

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primary societies, but they were expected to attract deposits from the general public. But the expectation has not been fulfilled and many co-operative central banks act as mediators among the State Co-operative Bank and the village primary credit societies.

NABARD has formed a scheme for the treatment of weak central co-operative banks. It provides liberal assistance to the State Governments for contributing to the share capital of the weak central cooperative banks selected for the purpose of State Co-operative Banks. There are now twenty State co-Operative Banks (SCBs) in the country. They form the summit of the co-operative credit structure in each state. The SCB finances and controls the working of the central co-operative banks in the State. It acts as a link amid NABARD and the co-operative central banks and village primary societies. The SCB gets its working funds from its own share capital and reserves, deposits from the general public and loans and advances from NABARD (formerly RBI).

### *Problems of Co-operative Societies*

A quite distressing fact of co-operative credit is the huge overdue of co-operative credit institutions, now expected to be between ₹ 9,000 crores to ₹ 10,000 crores. Apart from the common factors that are normally accountable for a huge level of overdues, intervention of the following external forces had also affected the revival performance of credit institutions to an important extent:

- Loan waiver
- Concessions in various forms towards repayment of principal
- Payment of interest

The problem has been further enhanced on the basis of the State Government's incapability to meet the financial commitments to co-operative banks emanating from waiver of loans, interest subsidy, etc. It is disturbing that 45 per cent of loans are outstanding in all over India; the percentage of these loans range from 23 in Tamil Nadu to 77 in Bihar.

Nowadays, the farmers are becoming organized and one of the basic demands of the farmers union is the cancellation of their debts to co-operative societies and banks. States have quietly agreed to such demands in order to write off these debts. This tendency of states to write off the debts is a matter of extreme concern, as it hampers recovery of dues from the farmers. The National Front Government wrote-off farmer's debts upto the value of ₹ 10,000; this was an ill-conceived measure. The problem of loan overdues is a matter of serious concern, as it affects the recycling of funds and credit expansion on the one hand, and economic viability of the lending institutions on the other.



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Another weakness of credit co-operation is tenants, share-croppers, landless agricultural labourers and rural artisans who are the poorest and, therefore, the neediest. The co-operative credit flow in percentage share ranges from 3 to 5 per cent over the years. Since these farmers generally depend on credit for the purchase of their inputs, the available credit to them is inadequate still. Finally, even though the share of the weaker sections of the rural community has been continuously increasing and is, at present, placed around 40 per cent, it still remains short of their essential production needs.

There is also the problem of uneven distribution of co-operative benefits as between different states. For instance, the loans advanced per member varied widely; the farmer of Gujarat, Punjab, Haryana and Tamil Nadu getting much more than those in Orissa, Bihar, U.P. and West Bengal. If viewed in another way, i.e., in terms of average credit per hectare of cropped area, it is only in five states, namely, Gujarat, Haryana, Kerala, Punjab and Tamil Nadu that such credit is much higher than (double or more than double) the All-India average.

Apart from considerable regional disparities in credit availability, the co-operatives have not been able to ensure an increasing flow of production loans and investment credit in most of the tribal and hilly areas.

However, the co-operatives have come to cover approximately the entire countryside, the membership is only around 45 per cent of the rural families and the agricultural labourers and rural artisans constitute only 10 per cent of the total membership. The weaker sections of the rural community have still not been adequately represented in the membership roll.

In the final analysis, the most exceptional weakness, which is at the root of many shortfalls in the co-operative performance, is in the management area. There has been substantial discussion over the years at all stages with regard to the need for proper manpower development in the co-operative sector. But, not much progress has taken place. The co-operatives themselves have shown a curious lack of appreciation of this problem.

### Check Your Progress

1. Which areas are covered under the term 'rural areas' for NABARD?
2. What is the benefit of Kisan Credit Card scheme?
3. What are the non-agricultural activities related functions of Regional Rural Banks?
4. What was the benefit of commercial banks funding the primary agricultural society?

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## 14.3 ROLE OF MICRO FINANCE, SHGS AND NGOS

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In this section, we have a look at some other means of obtaining agricultural credit.

#### 14.3.1 Micro Finance through Self Help Groups

Inefficiencies in formal finance have led to a number of innovative ideas. The emerging credit vehicle penetrating rural India has been the **Self Help Groups (SHGs)** with bank linkage schemes. To overcome the constraints and high cost of reaching the rural poor through banking services, NABARD has pioneered the concept of thrift and savings groups, commonly known as SHGs. Both government and non-governmental agencies promote the formation of SHGs.

Less than twenty people from a homogenous social background are brought together to form a group. This number has been chosen to keep the functioning of the group informal and flexible, because a group with membership beyond twenty is required to register under the Cooperative Credit Societies Act, 1904 or some other Act. Members agree to save a few rupees every week and deposit the money in a savings bank account opened in the name of the group. Each member is given a passbook to maintain a record of savings, loans, repayments, interest and bonus. Any member can approach the group for a productive loan. If the loan is sanctioned, then members pay (18–24 per cent) simple interest per annum. Under the NABARD scheme, a mature and regular group can get a matching loan from their own bank at a low rate of interest. On timely repayment of the loan, the group can avail twice and finally up to four times of their own savings as loan, to increase their kitty to meet the increasing monetary needs of their members looking to start economic activities of their own. NABARD refinances the local banks' loans at subsidized rates.

The SHG movement in the country has mostly been in the south (constituting a 64 per cent share). About 50 per cent of SHGs are in Andhra Pradesh alone, and about 90 per cent of these are all women's groups. Recovery from such groups is more than 90 per cent and is only now beginning to take off in other parts of India.

#### 14.3.2 Micro Finance Institutions

Micro Finance Institutions (MFIs) is a new generation of rural finance institutions that bridges the gaps left by the formal financial structure. These MFIs are willing to lend money to the poorest of the poor without collateral and with minimum formalities. This credit is always advanced to a group of individuals, and the MFI deals with the group as a single entity. Most MFIs work as intermediaries to link

SHGs with the banking system and this has emerged as the most successful model of micro finance. These institutes are a step forward in providing quality financial services to the poor without the rigidity and bureaucratic style of functioning of the cooperative system.

Robinson (1998) defined micro finance with reference to both urban and rural areas. Basically, micro finance refers to small-scale financial services for both credit and deposits that are provided to people who own/operate small or micro enterprises where goods are produced, repaired, recycled or traded, provide services; who work for wages or commission; who gain income from renting out small amounts of land, vehicles, draft animals or machinery and tools; and to other individuals and local groups in developing countries. The range of services has been expanded by the Asian Development Bank, which defines micro credit as the provision of a broad range of services such as deposits, loans, payment services, money transfers and insurance to poor and low income households and their micro enterprises (ADB 2000).

Micro credit is used by a large number of borrowers generally for fulfilling need of social obligations, consumption, and investment and even to repay older debts. Yet, recoveries are 90 per cent. Some of the most successful institutes are BASIX, Spandana and SHARE Microfin in Andhra Pradesh, ASA and Dhan Foundation in Tamil Nadu, MYRADA in Karnataka, Adithi in Bihar, RGVN in Assam and Orissa, Cashpor in UP and PRADAN in Jharkhand.

### **NGOs and agricultural finance**

Non-governmental organizations are an important support source of agricultural finance. The biggest benefit with the non-governmental organizations is their local area of focus. Most of the NGOs either have specialized differentiation or work in specific regions. This puts them at an advantageous position of being very close to the farmers and their problems. So they can raise funds and provide them donations and help regarding their immediate needs and issues. The government too regulates their funding through acts and rules. But NGOs are incomplete financial intermediaries. Depending mostly on donors for funding, these organizations can only offer help to the farmers in the area of credit.

### **14.3.3 Agriculture Insurance in India**

Crop production in India has been subjected to alterations/changes in weather and large-scale damages due to attacks by pests and diseases. As a result, crop insurance assumes a vital role in the stable growth of the sector. Despite technological and economic advancements, the condition of farmers continues to be unstable due to natural calamities and price fluctuations. Keeping this in view, the Government of India launched the agriculture insurance policy for farmers.

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The government has now established a separate Agriculture Insurance Company with capital sharing by four public sector general insurance companies—National Insurance Company, New India Assurance Company Ltd, Oriental Insurance Company Ltd and United India Insurance Company Ltd—and NABARD. Of the total paid up capital, 35 per cent is given by GIC, 30 per cent by NABARD and 8.75 per cent by the four public sector general insurance companies.

### **National Agricultural Insurance Scheme (NAIS)**

The National Agricultural Insurance Scheme (NAIS) has been implemented since the Rabi 1999–2000 season, replacing the earlier Comprehensive Crop Insurance Scheme. The scheme was started with the objective of providing insurance coverage and financial support to farmers in the event of failure of any of the notified crops as a result of natural calamities, pests and disease, and helping stabilize farm incomes, particularly in disaster years. The Agricultural Insurance Company of India Ltd (AICIL) was founded in 2002 and started operations in 2003 and has taken charge of implementation of the NAIS scheme.

This scheme is functioning in twenty-three states and two Union Territories. It is available to all the farmers (both loaner and non-loaner) irrespective of their size of holding. NAIS envisages coverage of all food crops (cereals, millets and pulses), oilseeds and annual commercial/horticultural crops. Sugarcane, ginger, onion, garlic potato, cotton, turmeric, chilli, pineapple, banana, coriander, cumin, jute and tapioca have already been covered under the scheme. Also, there is no upper limit for the insurance amount in NAIS.

The insurance premiums depend upon the type of crop and range from 1.5–3.5 per cent of the insured amount; 3.5 per cent for bajra and oilseeds, 2.5 per cent for other Kharif crops, 1.5 per cent for wheat and 2 per cent for other Rabi crops. Actuarial rates are being charged in case of annual commercial and horticultural crops. Apart from this, 50 per cent of subsidy in premium is allowed to small and marginal farmers on a 50:50 sharing basis by the Central and state governments. The subsidy on premium has gradually been phased out and at present only 10 per cent subsidy is available to small and marginal farmers.

The scheme is functioning on ‘area approach’ (defined areas for each notified crop for widespread calamities), and on ‘individual basis’ for localized calamities such as hailstorm, landslide, cyclone and flood.

In case the actual income of the farmer falls below the guaranteed income (product of average yield and MSP), he would be eligible for compensation to the extent of indemnity from AICIL. The area approach in NAIS is used for actual yield and price measurement of the insured crop. Initially, the scheme was to cover paddy and wheat only and would be compulsory for loaned

farmers and voluntary for non-loaned farmers in the States/UTs which opted for the scheme.

The scheme was implemented on a pilot basis during Rabi 2003–04 in nineteen selected districts of thirteen States for wheat and paddy (rice). The pilot project has been extended in Kharif 2004 also to various districts/states.

### **Farm Income Insurance Scheme**

The Department of Agricultural and Cooperation introduced the Farm Income Insurance Scheme (FIIS) in order to target the two critical components of a farmer's income— yield and price—through a single policy instrument. FIIS has been conceived to provide insurance for the minimum guaranteed income of farmers by integrating the mechanism of insuring production as well as market risks. The scheme was implemented on as a pilot project during Rabi 2002–03 in eighteen selected districts of twelve states for wheat and paddy (rice).

The government also provides a higher degree of subsidy under this scheme. The actuarial calculations determine the premium rates in this scheme. Presently, around 75 per cent subsidy is provided to small and marginal farmers and 50 per cent to other farmers.

The main features of this scheme are as follows:

- In case the actual income of the farmer falls short of the guaranteed income (product of average yield and MSP), he would be eligible for compensation to the extent of insurance from the Agriculture Insurance Company of India Ltd.
- The area approach would be used for actual yield and price measurement of the insured crop (like NAIS).
- This scheme would be compulsory for loaned farmers and voluntary for non-loaned farmers.
- Later on, NAIS will be withdrawn for the crops covered under FIIS but will continue to be applicable for other crops.

FIIS is provided for wheat and rice, which are comparatively less risky crops. The scheme should be extended to other crops also. Farmers should be encouraged to produce market-oriented products, which will give them more profits. The risk higher investment (to earn higher profits can be covered by insurance.

### **Varsha Bima (Rainfall Insurance Scheme)**

In 2004, the 'Varsha Bima' insurance scheme, also known as rainfall insurance scheme, was introduced by AICIL. This scheme was piloted in twenty areas in Andhra Pradesh, Karnataka, Rajasthan and Uttar Pradesh on the basis of rainfall patterns. During Kharif 2006, the scheme has been implemented in 150 districts covering sixteen states. Under this scheme, five different options are available to the farmers. These are:

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- Seasonal rainfall insurance (based on total rainfall from June–September)
- Sowing failure insurance based on rainfall from 15 June–15 August
- Rainfall distribution insurance based on weighted average of rainfall during the weeks from June to September
- Agronomic index on the basis of water requirement of different crops in specific areas
- Calamity causing extreme adverse deviation of 50 per cent or more in rainfall during the season

### Check Your Progress

5. Why is the membership of self help groups restricted to less than twenty people?
6. How do micro finance institutions work as intermediaries?
7. State the objective of the National Agricultural Insurance scheme.

## 14.4 PROBLEMS OF CAPITAL FORMATION

The problem of rural indebtedness has two aspects and, therefore, the solution is also two-fold. In the first instance, measures may be devised for cancelling old debts. Secondly, measures should be devised to see that fresh borrowing is limited to the minimum necessary productive type. It is also necessary to control the money lenders and regulate their activities.

### Remedies to the Problem of Agricultural Indebtedness

- **Settlement of old debt:** Most state governments and Union Territories have enacted appropriate legislation to scale down the debts of small farmers and to discharge non-institutional debts of weaker sections like landless labourers and rural artisans. In most states, legislation exists for compulsory reduction of ancestral debt and in a few cases, even for their liquidation. The difficulty with such legislation is that the farmers and the landless labourers may not take advantage, either because they are ignorant of such legislations or because they are afraid of the money-lender.
- **Reduce dependence on money-lenders:** In order to reduce the dependence of the rural people on local money-lenders, the network of institutional credit structure, is being rapidly expanded throughout the country to provide timely and adequate credit support to the small farmers and artisans.
- **Control of new loans:** It is not sufficient to help in the settlement of old debts. It is necessary to see that the farmers resort to borrowing only for the most essential and productive purposes. Non-productive loans should

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be avoided. Social and religious functions form an important part of the life of the Indian villages. The expenditure in connection with them cannot be eliminated so easily by advising farmers. Actually some institutional finance should be arranged for this purpose. In its report submitted in April 1976; the Sivaraman Committee outlined the following proposals:

- Consumption loans for marriages, births and deaths, religious expenses, medical expenses, education etc., should be provided by the Government corporations and nationalized banks to small farmers, landless labourers and artisans
- Banks and co-operatives should provide similar loans to marginal farmers
- Schemes should be devised to enable the various classes of people to return the loans
- In some states, legislation has been passed to prevent farmers from selling their lands to professional money-lenders who are not farmers. At the same time, measures should be taken to control the activities of money-lenders.

### **Problems and Government Policies since Independence**

The problems faced by the Indian farmers since independence are as follows:

- The average size of land holdings is quite small. It leads to fragmentation because of land ceiling acts and family disputes. Small land holdings are generally overmanned, which leads to disguised unemployment and low productivity of labour.
- The acquiring of modern agricultural practices and technology is generally inadequate. It gets hampered by high costs and impracticality in case of small land holdings.
- Illiteracy
- General socio-economic backwardness
- Slow progress in implementing land reforms
- Inadequate or inefficient finance and marketing services for farm produce
- Inconsistent government policy
- Inadequate irrigation facilities
- One third of all that is produced gets rotten due to inefficient supply chains.
- To tackle the common agricultural problems the government has altered its agricultural policy.

The salient features of the new agricultural policy of the government are as follows:

- Over four per cent annual growth rate
- Greater private sector participation through contract farming

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- Price protection for farmers
- Launch of the national agricultural insurance scheme
- Dismantling of restrictions on movement of agricultural commodities throughout the country
- Rational utilization of country's water resources for optimum use of irrigation potential
- High priority to development of the following:
  - o Animal husbandry
  - o Poultry
  - o Dairy
  - o Aquaculture
- Capital inflow and assured markets for crop production
- Exemption from payment of capital gains tax on compulsory acquisition of agricultural land
- Minimize fluctuations on commodity prices
- Continuous monitoring of international prices
- Plant varieties to be protected through legislation
- Adequate and timely supply of quality inputs to farmers
- High priority to rural electrification
- Setting up of agro-processing units and creation of off-farm employment in rural areas

### Check Your Progress

8. What are the two aspects of rural indebtedness?
9. What is one of the reasons for disguised unemployment in Indian agriculture?

## 14.5 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Rural areas for NABARD cover all villages, irrespective of the size of population and also towns, with a population not exceeding 10,000.
2. The Kisan Credit Card Scheme was introduced in 1998–1999 to facilitate short-term credit to farmers. It is popular among both the farmers and the bankers. Farmers have the flexibility of availability production credit avoiding procedural delays. For bankers, the need for repeated processing of credit application is avoided.



3. The non-agricultural activities related functions of Regional Rural Banks are the following:
  - Loans to artisans
  - Loans to small entrepreneurs
  - Consumer loans
  - Poverty alleviation programme
4. The benefit of commercial banks funding the primary agricultural society was that they could use PACS for disbursing agricultural loans and thus solve the serious problem of not having close contacts with farmers through their own branches and field staff.
5. The membership of self help groups is restricted to less than twenty people to keep the functioning of the group informal and flexible and because a group with membership beyond twenty is required to register under the Cooperative Credit Societies Act, 1904.
6. MFIs work as intermediaries by linking SHGs with the banking system.
7. The National Agricultural Insurance Scheme was started with the objective of providing insurance coverage and financial support to farmers in the event of failure of any of the notified crops as a result of natural calamities, pests and disease, and helping stabilize farm incomes, particularly in disaster years.
8. The problem of rural indebtedness has two aspects. First is related to old debts and second related with fresh borrowing.
9. One of the reasons for disguised unemployment is small holdings which are generally over-manned for cultivation in rural areas.

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### 14.6 SUMMARY

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- On the recommendation of Shivaraman Committee, appointed by the Reserve Bank of India in March, 1979, to study the problems related to agricultural credit, National Bank for Agriculture and Rural Development (NABARD) was established on 12 July 1982.
- The Government of India has entrusted the management of the NABARD to a Board of Directors.
- Initially, the paid-up capital of NABARD was ₹100 crore and authorized capital was ₹500 crore. The paid-up capital was initially contributed by the RBI and the Central Government.
- NABARD has engaged itself in the implementation of Swarnajanti Gram Swarozgar Yojna (SGSY). It has issued operational instructions to RBIs and Cooperative Banks.

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- Among the various institutional agencies engaged in rural credit, Regional Rural Banks (RRBs) play a significant role. These are specially designed financial institutions working under the guidance of NABARD.
- The RRBs are promoted by 'Sponsor banks', which are usually public sector banks. The steering committee on RRBs identifies the districts requiring these banks. Later, the Central Government sets up RRBs with the consultation of the state government and the sponsor bank.
- The co-operative movement has been in existence for over a century. According to many critics, the movement is utter failure and should be scrapped. The movement has done nothing to abolish poverty of the rural masses.
- The rural co-operatives have played a significant role in areas of credit, agricultural production, agricultural processing and marketing. The guiding principles of co-operatives are voluntary and have open membership, democratic control and equitable distribution of profit and utilization of resources.
- In the past few decades, the PACS have stepped up their advances to the weaker sections particularly the small and marginal farmers. This progress has been quite spectacular but not adequate considering the demand for finance from farmers.
- Inefficiencies in formal finance have led to a number of innovative ideas. The emerging credit vehicle penetrating rural India has been the Self Help Groups (SHGs) with bank linkage schemes.
- Micro Finance Institutions (MFIs) is a new generation of rural finance institutions that bridges the gaps left by the formal financial structure. These MFIs are willing to lend money to the poorest of the poor without collateral and with minimum formalities.
- Non-governmental organizations are an important support source of agricultural finance. The biggest benefit with the non-governmental organizations is their local area of focus. Most of the NGOs either have specialized differentiation or work in specific regions.
- Crop production in India has been subjected to alterations/changes in weather and large-scale damages due to attacks by pests and diseases.
- The National Agricultural Insurance Scheme (NAIS) has been implemented since the Rabi 1999–2000 season, replacing the earlier Comprehensive Crop Insurance Scheme.
- The Department of Agricultural and Cooperation introduced the Farm Income Insurance Scheme (FIIS) in order to target the two critical components of a farmer's income—yield and price—through a single policy instrument.

- The problem of rural indebtedness has two aspects and, therefore, the solution is also two-fold. In the first instance, measures may be devised for cancelling old debts. Secondly, measures should be devised to see that fresh borrowing is limited to the minimum necessary productive type. It is also necessary to control the money lenders and regulate their activities.

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### 14.7 KEY WORDS

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- **Self Help Groups:** This is a group of less than twenty people from a homogenous social background. Members agree to save a few rupees every week and anyone can approach the group for a productive loan.
- **Primary Agricultural Credit Society:** This is a co-operative credit society with ten or more persons working at the grassroots level of the short-term cooperative credit structure.
- **Regional Rural Banks:** These are specially designed financial institutions working under the guidance of NABARD catering to credit needs of the farmers and other segments of the rural economy.

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### 14.8 SELF ASSESSMENT QUESTIONS AND EXERCISES

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#### Short-Answer Questions

1. When was NABARD established? What are its principal activities?
2. Write a short note on the emergence of co-operative movement in India.
3. Briefly mention the Restructuring of PACS.
4. List the shortcomings of PACS.
5. What are the problems faced by co-operative societies?
6. Mention the remedies to the problem of agricultural indebtedness.

#### Long-Answer Questions

1. Discuss the functions of NABARD.
2. Analyse the performance and achievements of NABARD with reference to agricultural credit system in India.
3. Explain the functions of Regional Rural Banks (RRBs).
4. Critically analyse the strengths and weaknesses of the co-operative movement in India.

5. 'Non-governmental organizations are an important support source of agricultural finance.' Elucidate the statement.
6. Describe the schemes launched in support of agricultural insurance in India.

## NOTES

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### 14.9 FURTHER READINGS

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