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## UNIT 6 DIVERSIFICATION TRENDS OF INDIAN AGRICULTURE

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### 6.0 OBJECTIVES

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After going through this Unit you should be in a position to:

- appreciate the importance of allied activities in India's rural economy;
- identify the features of India's livestock economy;
- examine the progress made in the dairy sector of the economy;
- point out the issues of development in different areas of allied activities; and
- suggest course of action for future development of the sector.

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### 6.1 INTRODUCTION

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In the previous Unit, we have examined the role and importance of crop production in the Indian economy. We have examined that the crop production has expanded nearly four-fold during the last fifty years. We also reached a universally acceptable conclusion that till a major technological breakthrough occurs once again as it did in

the 1960s that resulted in Green Revolution crop production in India has reached a plateau. And with that the scope and possibilities of further increase in employment and income levels are remote.

It is imperative to raise employment and income levels in the rural economy. To achieve this there is limited choice but to diversify farm activities. Diversification in Indian agriculture can be achieved by promoting allied activities like fisheries and dairy farming.

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## **6.2 IMPORTANCE OF ALLIED ACTIVITIES**

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Allied activities assume critical importance in India's rural economy in more than one respects. They play a very important role:

- in bringing about a balance in the production system and utilisation of resources;
- in smoothening the income flows between seasons;
- in ensuring participation of people with nil or inadequate resources in productive activities; and
- in bringing about a balance in nutritive value of farm products.

Let us elaborate these further.

### **6.2.1 Allied Activities and Resource Use**

We may draw attention to the following facts:

- i) You have seen in the previous block that cultivable land in India is scarce. It is either not available for large number of people or is available in inadequate quantity. Therefore, cultivation cannot be a means of self-employment and income generation for a substantial proportion of the population in the rural areas which include landless labourers and marginal farmers. For these sections of people, allied activities can provide a source of gainful employment.

Activities such as poultry and piggery do not need land as a direct and major factor of production. Similarly, sheep and goat husbandry, although mainly depend upon the products of land (fodder), do not need stationary and highly fertile land. Sheep and goat themselves are mobile and hence, can be maintained on fodder which can grow on uncultivated/uncultivable pasture land and also on by-products of trees and other vegetative elements.

- ii) In India, arid and semi-arid areas, i.e., areas with an annual rainfall of 750 mm or less, are quite substantial. They cover about a third of the net sown area. About 16 per cent of the total soils belong to the types such as desert soils, hill soils, forest laterite soils, foot hill soils, mountain meadow soils and other types of mountain soils which are not directly usable for cultivation. In such areas, animal husbandry provides an alternative gainful avenue.
- iii) Traditionally, some tribes are used to a migrating pattern of living. In such environment sheep and goat husbandry provide an excellent avenue of gainful employment.
- iv) Biologically, sheep is an excellent converter of grass into useful products like meat and wool. On average, sheep and cattle, respectively, get 80 to 90 per cent and 60 to 65 per cent of their protein from forages and, therefore, do not directly compete with human beings for food and maintenance. Similarly, other animals such as buffalo, camel, donkey and horse though basically need products of land,

they do not compete with human beings for all their requirements of feed. Fishery, likewise, uses only that part of land which is not available for direct cultivation, i.e., land under water, saline or sweet, stagnant or flowing. The allied activities thus do not directly compete with human beings for a large part of their maintenance requirements.

### **6.2.2 Allied Activities and Supply of Products**

Allied activities produce products that are very useful to human beings. These products help in reducing man's dependence on land for survival. Milk, meat, eggs, fish, wool, hair and skin supplement the total stock of products produced on land, i.e., food and fibre.

The protein contents of beef, mutton, fish and egg are 20, 18, 17 and 13 per cent, respectively, as against 8, 11 and 12 per cent in the case of rice, maize and wheat, respectively. In a country like India where malnutrition and unbalanced diet are common features of millions of people, the availability of indigenous nutritive products is very critical.

The allied activities thus work as a balancing force for availability of nutrition. In certain cases, the conversion efficiency of animals, birds, and fish as producer of food is more than the direct use of land for production of such food.

The role of allied activities is thus more supplementary and complementary and less competitive with cultivation of crops.

### **6.2.3 Allied Activities as Sources of Energy and Implements**

Allied activities make cultivation more efficient by providing sources of energy and implements. These activities are the sources of organic manure, draught and traction power. These are also the source of some traditional implements like leather buckets and ropes. Camels, mules and donkey are better suited as means of transport in certain areas where the use of mechanical means of transport (such as tractor) is either not feasible or is very costly. In view of the increasing energy crisis, some countries have started the use of their cattle and buffaloes as a source of energy for the farm sector.

The allied activities enhance the economic viability and even technical feasibility of cultivation by providing important inputs at the production stage and making use of the by-products at the disposal stage. Allied activities thus open new dimensions of judicious land utilisation through mixed or diversified farming.

### **6.2.4 Allied Activities as Sources of Employment and Income**

The allied activities are playing a complementary role to farm sector by providing a stable and dependable source of employment and income. One should look into the changing level of monetisation and regular cash flows in areas where allied activities have been adopted on a more systematic and scientific basis. These cash flows are changing the nature of other activities also in the rural areas which were previously tailored only to the seasonal income flows of cultivation.

In view of the above factors, the allied activities could be relied upon as a major instrument of social change, for supplementing the income and providing a large scope for employment in the rural areas. In short, allied activities have a very important role to play in stabilising the economy of the rural people.

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## 6.3 ANIMAL HUSBANDRY

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The livestock economy of India has gained momentum during the last three decades or so. Its performance is based mainly on the changing composition of animals in favour of milk-yielding bovines. The milk trend underlying the livestock economy for past decades was accelerated by modernised marketing along the AMUL model and by determined measures for the protection of health and improvement of breed, resulting in what has come to be known as the “White Revolution”.

### 6.3.1 Role of Livestock

The role of livestock can be better appreciated by their changing share in the total agricultural production. The share of livestock products in the agricultural sector was 6 per cent in 1970-71; it has increased to about 15 per cent presently. Thus, the rate of growth of output in the livestock sector has been more than that in the agricultural output sector.

The contribution of livestock is about 12 times that of fisheries and over seven times that of forestry. Employment in animal husbandry can be assumed to be of the same order.

Animals are a major source of energy input; they also provide dung, which is an important source of biological manure. The major and more widely known contribution of livestock is in terms of livestock products such as milk, milk products and to an extent meat, hides and skin, etc.

### 6.3.2 Features of the Livestock Economy

The livestock economy of India has several outstanding features. Among these, the more important can be mentioned as follows:

- i) India is known for its cattle wealth and ranks high among countries that have a large bovine population relative to their human population. About one-sixth of the world's cattle and one-half of the world's buffalo population are concentrated in India.
- ii) In rural India for every two persons there is one bovine animal.
- iii) India would rank high among countries of the world using bullocks for work as a source of motion power.
- iv) India has the largest buffalo population in the world. The use of the female buffalo as a milch animal is perhaps a distinctive feature of India. Despite a large number of breeding cows, the share of buffaloes in total milk supply is larger. While cows constitute over 66 per cent of total milch animals, they supply less than 45 per cent of total milk produced in the country.

India's livestock economy has thus many distinct but at the same time perplexing features. These need to be studied with care.

### 6.3.3 Size and Composition of Livestock

Data on livestock are collected through the quinquennium census in India. As per available data, the bovine population (i.e., cattle and buffaloes) are the two most important species of livestock for the source of draught power and dairy products. While cattle is reared for the purpose of getting draught and traction power, buffaloes are mainly reared for the purpose of dairying) in undivided India increased by just 2.3

per cent over a period of 25 years between 1920 – 1945. On the other hand, since Independence bovine population has been increasing at an annual average rate of about 3.0 per cent.

Some of the important facts brought out by the censuses have been as follows:

- 1) There has been a continuous increase in the number of total cattle and buffaloes, number of breeding cattle and buffaloes (milch animals) and working animals during the post-independence period. The proportion of cattle in total animals has slightly declined over the period but still constitute about three-fourth of the total cattle and buffaloes.
- 2) On an average, about 70 per cent of the total cattle and buffaloes are of the mature age, i.e., more than 3 years and the remaining are young animals. The adult animals are almost equally divided into working and milch animals. Working animals mainly include male cattle and buffaloes, which are used for agriculture and transportation purposes and for breeding. The milch animals include adult cows and female buffaloes which are used for production of young stock and milk.
- 3) A predominant proportion of working animals is constituted by bullocks.
- 4) On an average, 4 to 5 out of every 10 milch animals are in milk, i.e., lactating stage at any time. The remaining ones are dry animals.

#### **6.3.4 Inter-State Variations**

The following observations can be made about the distribution of livestock as between the different states of the country:

- 1) Uttar Pradesh stands first in respect of total livestock and also in respect of buffaloes, pigs, horses and ponies.
- 2) Madhya Pradesh and Rajasthan are two other states which individually account for more than 10 per cent of total livestock in the country.
- 3) Camels are available in the north-western part of the country, i.e., Rajasthan and Haryana. Similarly, Uttar Pradesh, Madhya Pradesh and Bihar together have half the total number of pigs in the country. Only four states, viz., Rajasthan, Andhra Pradesh, Tamil Nadu and Karnataka, account for more than two-third of total sheep in the country. About 45 per cent of total buffaloes are found in three states, viz., Uttar Pradesh, Andhra Pradesh and Madhya Pradesh.

#### **Check Your Progress 1**

- 1) Highlight the important functions of allied activities in India's rural economy.

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- 2) Allied activities are not competitive, but complementary to cultivation. Explain in brief.

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- 3) What are the types of products available from allied activities?

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## 6.4 DAIRY FARMING

Over the years, dairy farming has emerged as the most important allied activity in the farm sector of the Indian economy. Along with Green Revolution, the White Revolution has brought about a critical change in the income and employment pattern in the rural economy. The revolutionary “Operation Flood” has taken India to the top place in production of milk and milk products. India has truly and squarely emerged as a nation where ‘rivers full of milk’ flow.

### 6.4.1 Breeds of Dairy Animals

Dairy animals in India can broadly be classified into three groups as follows:

- 1) **Indigenous Cows:** Cows presently available in India are largely indigenous in origin and a few are exotic also. There are about twenty-six well-defined indigenous breeds in addition to some nondescript breeds of cattle. Based on the utility of the cattle as a source of draught power or milk production, the indigenous breeds are classified into three major groups as follows:
  - i) **Draught breeds:** The bullocks of these breeds are good as draught animals. The cows of these breeds are, of course, poor milkers. Fourteen out of twenty-six well-defined breeds are exclusively draught breeds. These breeds are locally known as Amritmahal, Bachaur, Bargur, Dangi, Hallikar, Kangayam, Kenkatha (Kemvaria), Kherigarh, Khillari, Malvi, Nagori, Ponwar and Siri.
  - ii) **Dual purpose breeds:** There are eight breeds of cattle in India which produce calves which develop into good bullocks and heifers which develop into good milking cows. These breeds are known as Gaolao, Haryana, Kankrer, Krishna Valley, Mewati (Kosi), Ongole (Nellore), Rath and Tharpanker.
  - iii) **Dairy breeds:** There are four breeds which belong to this group. The cows of these breeds are high milk-yielders but the bullocks are poor as draught animals. These breeds are Deoni, Gir, Sindhi (Red Sindhi), and Sahiwal.
- 2) **Exotic Breeds of Cows:** The main exotic breeds imported in India are Jersey, Holstein Friesian, Ayrshire, Brown Swiss, Guarnsey and Red Dame. Some of these breeds were imported as back as 100 years. These breeds are basically

dairy breeds. However, it is ascertained that even crossbred bullocks are found quite useful for work as compared to the vast majority of non-descript type of bullocks. At present, they are used for improving the breed of indigenous cattle by cross-breeding programmes.

- 3) **Buffalo Breeds:** There are seven well-defined buffalo breeds in India in addition to few localised breeds. The main breeds are known as Jaffarabadi, Mehsana, Murrah, Nagpuri, Nali, Ravi and Surati. Except for Nagpuri, all breeds are good milkers.

#### 6.4.2 Operation Flood

Operation Flood marks a turning point in the history of dairy farming in India. It marked a switchover from the traditional system of marketing and production of milk to a modern new system of organised dairies.

The traditional channel of milk handling does not require an expensive infrastructure such as a dairy plant or other costly equipment, chilling station, refrigerated or insulated vans and employment of technically qualified staff with high salaries. Because of this, all possible permutations of these systems incorporate two features, viz.,

- 1) Absence of elaborate and expensive facilities and therefore little capital investment per litre of capacity; and
- 2) Absence of direct link between the producers and the consumers.

Even when the demand-supply situation compels very high selling price, the producers get very little, the middlemen pocketing the lion's share.

The organised dairies collect milk through one of the following systems:

- 1) Directly from the producers and middlemen alike by establishing village procurement centres; and
- 2) From the producers and middlemen alike by establishing milk collection and chilling centres; and
- 3) From primary co-operative societies.

Primary co-operative societies connect the primary producers with the marketing organisation and hence offer an improvement over the traditional unorganised dairy sector.

In pursuance of realisation of this philosophy, the Operation Flood was launched in the year 1969-70. With that milk production and marketing entered a new phase.

The Operation Flood was launched to realise primarily two objectives:

- 1) To ensure remunerative price to milk producers throughout the year through producers' co-operatives; and
- 2) To provide regular supplies of milk to consumers at a reasonable price.

The initial corpus of funds for the implementation of Operation Flood was generated by the sale of 1,27,517 tonnes of skimmed milk powder and 39,696 tonnes of butter oil provided by the World Food Programme. The Indian Dairy Corporation was specifically set up by the Government of India for receiving these gifts and generating funds by their sale for the implementation of the project.

The initial corpus provided the basis for integrated dairy development to be taken up all over the country.



Operation Flood has been designed to lay the foundation for a viable, modern and self-sustaining dairy industry in the country. The major activities taken up include:

- organisation of village level co-operatives and district level co-operative unions of milk producers,
- provision of technical inputs through the co-operative structure, and
- setting up of processing capacities and marketing facilities in rural milk sheds as well as in the metropolitan dairies.

Another feature of the Operation Flood project is the setting up of a National Milk Grid to offset the regional and seasonal imbalances in milk collection and procurement and to even out the flow of milk to various demand centres. The National Milk Grid is strengthened by commissioning (i) long distance rail milk tankers and (ii) road milk tankers, as well as creating storage facilities at strategic locations for preservation of milk powder, butter and other milk products.

The major achievements of the Operation Flood can be briefly summarised as follows:

- The programme has made a commendable impact on milk production. An assured outlet for a perishable product like milk at fixed prices is a sufficient incentive for rural enterprises to respond.
- In the past, the large share of buffalo milk in the market supply of milk created a problem of sharp seasonal fluctuations. These fluctuations have largely been contained now. A bulk of the milk procured now is converted into milk products.
- Organised marketing has helped to increase the income of owners of milch animals.

The impact on income distribution, however, is uneven. Organised marketing eventually concentrates on urban and relatively large consumption centres. The milk scheme does not directly serve the rural areas.

## **Check Your Progress 2**

1) Mention the important breeds of dairy animals in India.

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2) What is Operation Flood? What have been its principal objectives?

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- 3) What are the main features of Operation Flood?

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## 6.5 GOVERNMENT MEASURES OF ASSISTANCE

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The Government had, rightly, realised the importance of allied activities for the development of India's rural economy at the beginning of the First Five Year Plan in April 1951 itself.

The Government has drawn up a comprehensive programme of development for the animal husbandry and dairy farming sector of the Indian economy. The main components of the programme are as follows:

- 1) **Key Village Scheme:** The key village scheme was introduced during the First Five Year Plan and was the main plank for cattle development. Its basic objective was the multiplication of superior germplasm from the established farms in selected areas in breeding tracts. The scheme envisaged a multi-faceted approach to cattle development by giving simultaneous attention to better breeding, improved feeding, effective disease control measures, scientific management practices and organised marketing facilities.

The scheme has been considerably expanded in the subsequent plans.

- 2) **Intensive Cattle Development Project (ICDP):** Experience with the Key Village Scheme had shown that a large number of dairy plants set up were not able to collect sufficient quantities of milk. These considerations led to the formulation of the ICDP as a part of the Special Development Programmes started during the later half of the Third Five Year Plan.
- 3) **Animal Health Programme:** Animal diseases not only take a heavy toll on lives of animals, but also reduce their milk production capacity. The most commonly known and most damaging diseases have been rinderpest and foot and mouth diseases. Other diseases are tuberculosis, brucellosis, mastitis, etc. Improvement of animal health as a whole requires, on the one hand, awareness among owners, and on the other, establishment of medial centres. Concerted action has been taken by the government along these lines.
- 4) **Improvement of Breed:** While better animal stock protects the potential production capacity, improvement of breed helps to increase the milk production potential. As mentioned earlier, buffalo as a dairy animal is developed more in India than elsewhere. Breeds of cattle developed outside India are high milkers. Breed improvement programme consists mainly of developing pure Indian breeds, crossing and back-crossing of cattle breeds and reproducing the improved breeds. There are 26 breeds of cattle and 7 breeds of buffaloes. Out of them, for 12 breeds of cattle and 4 breeds of buffaloes breed characteristics have been identified by the Indian Council of Agricultural Research (ICAR).

The Government has taken measures to improve the breeds by setting up cattle breeding farms and artificial insemination centres all over the country.

- 5) **Artificial Insemination:** Artificial insemination and preservation of semen is an important aspect of breed improvement. Established breeds can have wider coverage through artificial insemination.
- 6) **Feed and Fodder Development:** Better and special quality breeds unless accompanied by increased supply of fodder and feed would not yield desired results. Ninety per cent of the country's bovine population subsists on grass in common grazing land or pastures. Only five per cent of the cultivated area is under cultivated fodder. Attempts to solve the feed and fodder problem, to achieve a continuous high rate of growth of animal products along with the problem of increasing crop production, would strain available land and such other inputs as fertilisers and irrigation. Besides, the production system will have to change from the traditional to a modernised one. Technological research and organised marketing are efforts towards modernisation of the livestock economy. Piecemeal efforts do not prevent sliding back.

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## 6.6 POULTRY FARMING

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Poultry farming is possible in widely differing agro-climatic environment and provides an excellent opportunity for gainful employment to idle or underemployed members of rural families. As a result of organised and concerted efforts made under poultry development plans on a countrywide scale, a strong base has been laid and poultry farming has established itself in India as a profitable commercial enterprise.

### 6.6.1 Features

Poultry as an economic activity exhibits a scene of wide contrast in India. The size of production unit and sophistication of its management varies from one or two domestic birds to tens of thousands of exotic breeds, on the one hand, and from absolutely no care to a highly sophisticated, specialised scientific and mechanised management of poultry farms on the other.

India has achieved a commendable progress in poultry. This progress is sometimes considered comparable with the advances made in the wheat production.

Some of the important features of poultry farming in India are as follows:

- 1) More than 90 per cent of the total poultry birds in India are fowls. About 45 per cent of the total fowls are laying birds while the remaining ones are used for broiler.
- 2) There are about 20 identified breeds in India. The indigenous breeds are well known for their adaptability to local climatic and geographical conditions. These are good brooders, foragers and efficient mothers. These are, however, poor layers. The improved breeds include some pure exotic strains, cross-bred strains and graded desi strains. The imported strains include White Leghorn, Australorps, Succex, Minorca, White Cornich, Rhode Island Reds and New Hampshire. The first four are heavy layers and White Cornich is a good broiler bird. The remaining are dual purpose birds.
- 3) India at present enjoys the seventh rank among the countries in respect of the production of eggs. The increase in the output of eggs has resulted from the increase in laying stock as well as increase in the average number of eggs by a layer during the year. The improvement in yield has resulted largely on account of increasing proportion of improved layers in the total laying stock. The productivity of improved strains has been about three times more as compared with the indigenous ones. There has been a considerable technological improvement in this regard.

- 4) Andhra Pradesh and Maharashtra are the two states, which individually account for more than 10 per cent of the total eggs produced in the country. Kerala also produces about 10 per cent of the total egg production in the country. West Bengal, Tamil Nadu, Karnataka and Bihar also have a sizeable contribution to the total production of eggs in the country. Most of these states have an advantage of local markets available in the metropolitan cities situated within the states. This is also supported by the number of hatcheries working in these states; these supply one-day-old good quality chicks to the poultry farms. The role of private sector is more prominent in the setting up of the hatcheries.

### **6.6.2 Government Measures of Assistance**

The government has undertaken a number of steps towards development of poultry farming.

- 1) During the First Five Year Plan, an All India Poultry Development Programme was launched. The aim was establishment of Poultry Extension-cum-Demonstration Centres. The scope of the programme was enlarged during the subsequent plans by establishing Regional Central Government Poultry Farms. These centres were set up to demonstrate the modern methods of poultry, impart training in poultry raising and supply infrastructural facilities. The concepts of backyard poultry-keeping yielded place to poultry-farming as a commercial enterprise.
- 2) Intensive Egg and Poultry Production-cum-Marketing Project is another important programme. The project was launched with an area development and package approach. Under this programme, centres were established in selected urban areas in different states. Scientific poultry breeding programmes were launched and central poultry farms were set up as a first step towards attaining self-sufficiency in the production and supply of high quality chicks.
- 3) In the early seventies, the selective breeding programme initiated earlier at the Central poultry farms was modified and a Co-ordinated Poultry Breeding Project was launched in which three central and a number of state poultry breeding farms participated. Poultry disease control measures and disease diagnostic services were strengthened and mobile veterinary clinics were established.
- 4) Commercial poultry production based on scientific breeding was started in India in the 1960s. At that time franchise hatcheries of foreign based poultry breeding organisations were set up for commercial mass production of genetically superior hybrid chicks. As a result, superior quality hybrid chicks with excellent egg laying potentiality became available in the country in large numbers.
- 5) The initial attempts based on size/family selection programme made by the Central and State farms in the 1960s to develop high egg laying strains of chicken yielded some encouraging results. However, it was found that the co-ordination between the Central and State farms was not satisfactory, and that the breeding programme needed enlargement in size and uninterrupted pursuit in a sustained manner. Further, a modification of the technical programme was considered necessary to achieve the desired goal of production of high yielding stocks expeditiously. A revised technical programme was, therefore, drawn up in the early seventies for launching a co-ordinated Poultry Breeding Project by the Government of India.

### **6.6.3 Issues in Poultry Development**

As stated, earlier poultry were largely seen as a backyard enterprise. It is only since the 1960s that the poultry farming has been taken up as a commercial enterprise. Introduction of deep litter and cage system of poultry-keeping, production of balanced feed, multiplication of exotic and high-yielding layers in public and private sectors,

mass preventive vaccination against common poultry diseases are the major contributory factors.

As a result of this enterprise, superior quality hybrid chicks with excellent egg laying potential have become available in the country in large numbers. A large number of feed manufacturing units in private, public and co-operative sectors have been established in the country

The policies and strategies proposed for poultry development in the country have provided for the following:

- large-scale development of quality poultry stock within the country to increase egg and meat production and make the country self-reliant for quality stock;
- establishment of adequate marketing arrangements; and
- improvement of health coverage, extension and training programme.

The poultry sector has reached a stage in development where the following issues merit attention.

- 1) One major shortcoming of our poultry development programme has been that it is largely production oriented with little attention paid to marketing. The result is the periodic boom and busts with farmers feeling the pinch. Today, the bulk of eggs and poultry reach the consumer from the farmer's door through a long chain of middlemen who appropriate a large part of the consumer's rupee. Thus, the increase in production does not result in an equitable and proportionate benefit to the farmer. To ensure a remunerative price to the producer and a reasonable price for the consumer, a suitable marketing channel should be organised on priority basis.
- 2) Lack of quality control on balanced poultry feed and lack of availability at reasonable price adversely affect the growth of poultry farming in the country. Field reports indicate that the mortality in chicks and drop in egg production are sometimes due to poor quality of feed available in the market. Feed analysis laboratories should be set up in all pockets where poultry development has been taken up to provide quick and inexpensive testing to poultry farmers.
- 3) The need to organise an efficient poultry health programme in keeping with the dynamic growth of the industry is both urgent and vital. Towards this end, the disease diagnostic facilities need to be strengthened for the benefit of poultry farmers. Mobile vans to extend these facilities to the remote poultry farmer's doorsteps are also needed.
- 4) A Poultry Corporation at the national level needs to be established to induce healthy competition between public and private sector hatcheries to the eventual benefit of farmers.
- 5) The hatcheries are known to be a potent source for transmission of egg-borne and other poultry diseases through supply of baby-chicks. In order to check the spread of diseases, it is essential to regulate the hatcheries through a proper licensing system.
- 6) The substantial development of the poultry industry at present is centred mainly around large cities and towns where a large number of commercial poultry farms have been established. The rural community received very little benefit from the development of poultry farming. Poultry farming should be encouraged in the rural and backward areas of the country to build a farmer base for the industry. It could help them to overcome the twin problems of poverty and poor health.
- 7) Extension support needs to be enlarged and strengthened to help the transfer of appropriate technology of modern poultry farming to farmers in the rural areas.

Training should be provided on a regular basis to the extension personnel to update their knowledge. Systematic arrangement should be made to obtain reliable information on all aspects of poultry farm economies.

### **Check Your Progress 3**

- 1) Examine the importance of poultry farming for the rural economy.  
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- 2) Review in brief the main features of poultry farming in India.  
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- 3) Examine the main issues being faced by the poultry farming sector in India presently.  
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## **6.7 FISHERIES**

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Fisheries constitute another important allied activity in India's rural economy.

### **6.7.1 Importance of Fisheries**

The importance of fisheries in India's rural economy can be judged from the following:

- 1) Fisheries largely depend upon the resources which are not directly available for crops or animal husbandry and hence it supplements income without competing for the inputs.
- 2) A high quantity of land and water resources covered by seas and oceans are not available or are not useful for raising crops or livestock. In India this is all the more important because of the small per capita arable land and irrigation water resources. On the other hand, there is a huge potential of fish crop.

- 3) Fisheries are also important from the angle of improving nutritional standards of a majority of the people.
- 4) It is also an important source of foreign exchange.
- 5) Fishery is a labour-intensive activity and hence would play a significant role in providing gainful employment to the weaker sections of the society.

### 6.7.2 Potential of Fisheries

India has a long coastal line of about 6,535 kilometres. Considering 320 kilometres into the sea as the exclusive economic zone, it amounts to a total area of about two million square kilometres (6535 km x 320 km) available for marine fishing. The area thus available for marine fishing adds about 64 per cent of the area to the country's total land surface. Unlike crop and animal husbandry, fish farming in the sea involves more of harvesting operations, cultivation and nursing being done by natural elements.

In addition to the coastline area, a total of 9.5 million hectares is available for inland fish farming, including brackish water fish farming.

### 6.7.3 Types of Fish Farming

Fish farming, as indicated above, is of two types: Marine fishery, and Inland fishery.

**Marine fishery** implies fish farming in sea water.

**Inland fishery** can be divided into two groups, namely fresh water and brackish water fisheries.

**Fresh water fisheries** exist in the rivers, canals and irrigational channels, large fresh water lakes, numerous small lakes, jheels, reservoirs, ponds and tanks.

**Brackish water fisheries** comprise the fisheries in sprawling estuaries of river mouths, brackish water lakes, lagoons and swamps containing tidal waters along the coastline. Adopting an ecological classification, both fresh and brackish waters can be categorised under lotic or lentic types. The **lotic fishery** includes inland waters in which the water body as a whole is continuously in a state of motion. On the other hand, **lentic fishery** includes standing water series and those having little water motions at the inlets and outlets. Lentic type of water bodies also encompass both fresh and brackish waters.

There is another important way of sub-dividing the inland fisheries into two classes, namely, capture and culture fisheries. In **capture** fisheries, the role of the human agency is limited only to capturing fish or at most to regulating the mode of capture. In **culture** fisheries which are provided by impounded waters of tanks, pond and embanked brackish waters, human beings undertake various positive measures for culture effecting definite increase in production. In other words, in capture fisheries human beings only reap the aquatic harvest without having to sow and in culture fishery they have to tend and nurse before reaping the harvest.

### 6.7.4 Marine Fisheries

The progress of fisheries in India has been more pronounced in the field of marine fishery. A positive approach towards a modernised marine fishing industry was adopted after Independence, taking into account the vastness of its resources and the need to apply tools of research and mechanisation for its development. The principal measures introduced include replacement of natural fibres with synthetic fibres for making nets, mechanisation of boats primarily as a means of propulsion, development of trawl



fisheries mostly in the near shore waters and the introduction of mechanised device for fish location.

Marine fisheries of India can be broadly classified into (1) coastal fisheries or inshore fisheries, and (2) offshore fisheries. Of the vast coastline about three-seventh is in the west coast and four-seventh in the east coast.

About two-thirds of the marine fish catch are from the west coast and one-third from the east coast. The varieties caught are mackerel, prawns, pomfrets, Bombay duck, etc.

India is the largest fish producing country among all the countries bordering the Indian Ocean. Various estimates based on exploratory surveys and production of prime organic matter in the Indian Ocean have indicated a possible annual yield of nearly 11 million tonnes of fish. At this level of exploitation, the Indian Ocean would be at par with the more intensely exploited oceans such as the Atlantic and the Pacific. The projected potential of total fish production from the world oceans is of the order of 200 million tonnes. Correspondingly, the share of the Indian Ocean would be nearly 40 million tonnes. As against these potentials, the present production from the Indian Ocean is only three million tonnes of which India's share is nearly half.

### **6.7.5 Inland Fisheries**

Inland fisheries can be divided into two groups, namely fresh water and brackish water fisheries. Fresh water fisheries exist in the rivers, canals and irrigational channels, large fresh water lakes, numerous small lakes, jheels, reservoirs, ponds and tanks. The brackish water fisheries comprise the fisheries in sprawling estuaries of river mouths, brackish water lakes, lagoons and swamps containing tidal waters along with the coastline.

It has been estimated that the length of principal rivers in India along with their tributaries is about 29 thousand kilometres; canals and irrigational channels cover about 112.6 thousand kilometres. The reservoirs and lakes situated all over India present a water area of about 29 lakh hectares for fishery development. The capture fishery water in the form of open estuaries or river mouths, brackish water lakes and back waters are estimated to have an area of 7.6 lakh hectares.

The main fresh waters species of fish found in India are major carps, catfish, sheat fish, live fish, mullets, feather backs, prawns, etc. The vast majority of fish in brackish water are marine species with sufficient tolerance for salinity variations. The important estuarine species are clerpeoids, anchovies, mullets, cat fish, perches, prawns and crabs. Fishing is undertaken by operating different types of gears, namely, shore-seines, boat-seines, gill-nets, hook and line fishing and various types of traps.

India ranks third in the world in inland fish production. The first being China followed by Russia. It may be noted that while the world's catch of inland fish forms only about 15 per cent of the total fish catch, the inland fish production in India constitutes about 51 per cent of the country's total fish production. This shows the importance of inland fish in India's economy.

### **6.7.6 Government Measures of Assistance**

The government has taken a number of steps through various development programmes. These include:

- Organising intensive surveys on marine fishery resource assessment and ensuring optimum exploitation of marine resources through a judicious mix of traditional country boats, mechanised boats and deep sea fishing vessels;



- Intensify efforts on processing, storage and transportation of fish, improving marketing, tapping vast potential for export of fish and fish products; and
- Improving the socio-economic condition of fishermen.

The development programme for inland fishery includes promotion of inland fish production on scientific basis through extension, education, training and provision of inputs with a view to increasing the productivity of water area. Brackish fish farming is given special attention in order to provide economic benefits to coastal fishing communities through a blend of culture and capture fisheries.

#### **Check Your Progress 4**

- 1) Identify and explain different types of fish farming.

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- 2) What are the important measures taken by the government towards the development of fisheries.

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### **6.8 LET US SUM UP**

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Allied activities assume crucial importance in India's rural economy. These activities play a very important role in bringing about a balance in the production system and utilisation of resources. They smoothen the income flows between seasons, ensure participation of people with little or inadequate land resources in productive activities and bring about a balance in nutritive value of farm products.

Each of the allied activities, be it animal husbandry, dairy farming, poultry farming or fisheries, is to be seen as complementary to crop farming. These activities do not cause any shift of resources from crop cultivation; they present an alternative avenue of income and employment generation.

There has been substantial developments in certain allied activities. For example, milk production in India has increased from 17 million tonnes in 1950-51 to 81 million tonnes in 2000-01. The per capita availability of milk has also increased from 124 grams per day in 1950-51 to 217 grams per day in 2000-01. Similarly fish production in the country has increased from 0.7 million tonnes in 1950-51 to 5.6 million tonnes in 2000-01. Over this period export of marine products has increased 20 thousand tonnes to 430 thousand tonnes.

The development programmes for the farm sector formulated in the recent plans hinge very closely on development of allied activities.

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## 6.9 KEY WORDS

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<b>Aquaculture</b>	: The cultivation or rearing of aquatic plants or animals.
<b>Arid Lands</b>	: Dry, parched lands
<b>Broiler</b>	: Young chicken raised for broiling or roasting.
<b>Brooder</b>	: The young of a bird produced at one hatching or birth.
<b>Diversification</b>	: To expand the range of the available products.
<b>Exotic breed</b>	: A breed of animal that has been imported from or that has originated in a foreign country.
<b>Hatchery</b>	: A place for hatching eggs especially of poultry or fish.
<b>Husbandry</b>	: Farming and a careful management of resources.

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## 6.10 SOME USEFUL BOOKS

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Dantwala, M. L. (ed.) 1991, *Indian Agricultural Development Since Independence*, Oxford and IBH Publishing and Co., New Delhi.

Dhingra, I. C., 2003, *Special and Preferred Sector Finance*, Sultan Chand and Sons, New Delhi.

Government of India, Indian Economic Survey, Various Issues

Government of India, Report of the National Commission on Agriculture

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## 6.11 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

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### Check Your Progress 1

- 1) Read Section 6.2 and point out its importance in efficient resource utilisation, supply of agricultural products, employment, and income generation.
- 2) Answer in line of the fact that allied activities do not compete for resources and help in supplementing the income of farmers.
- 3) Read Section 6.2 and answer.

### Check Your Progress 2

- 1) Read Sub-section 6.4.1 and answer.
- 2) Read Sub-section 6.4.2 and answer.
- 3) Read Sub-section 6.4.2 and answer.

### Check Your Progress 3

- 1) Explain how poultry helps in employment and income generation.
- 2) Bring out the important aspects of poultry farming given in Sub-section 6.6.1
- 3) Read Sub-section 6.6.3 and answer.

### Check Your Progress 4

- 1) Explain the types of fisheries given in Sub-section 6.7.3
- 2) Read Sub-section 6.7.6 and answer.