UNIT 4 DEVELOPMENT OF INDIAN AGRICULTURE

Structure

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4.0 OBJECTIVES

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

• explain the phases of agriculture development in India;

• state the various programmes for land improvement;

• explain green revolution in the country;

• highlight the role of education, research and extension in agricultural advancement.

• assess the improvement in animal production and advances in animal sciences; and

• identify the future steps to be taken looking into the globalization of agriculture.
4.1 INTRODUCTION

Agriculture is being practiced in the country from Vedic period. There have been continuous changes leading to refinement in all the concerned aspects in phases for better yields. Biodiversity is being used for better plant types with desired characters to have better yields with resistance to biotic and abiotic factors, needed yield parameters and suitable for specific agro-ecological conditions. Crops are selected on the basis of soil groups like alluvial soils, black soils, red soils, laterite soils, mountain and hill soils, arid and desert soils, saline and alkali soils, peat and organic soils. The soils differ in texture and consistency like sand, loam and heavy soils. They vary in fertility levels comprising of different quantum of nitrogen, phosphorus, potash, sulphur, calcium, magnesium, iron, sodium as major elements and boron, manganese, molybdenum, zinc, copper cobalt as micro elements. Fertility level is decided looking to the crop to be grown, Soil water holding capacity varies and the irrigation requirement depends upon the crop and soil structure. Better methods have been developed for raising various crops. Crop is protected from diseases, insect-pests and weeds by use of mechanical practices, chemicals and bio-pesticides. Regular researches have resulted in better equipments for field operations, harvesting and threshing. Now the harvest can be stored in better storage structures quite safely. The post-harvest technology has attracted the attention of cultivators all the times. The technological improvement was influenced by the dynasties of the country.

India has 329 million hectare geographical area of which around 180 million hectare is cropped. There are 95 million agricultural holdings of which 75 per cent are marginal and small farmers with up to 2 ha land holdings. Expansion of cultivable land is not possible, hence efforts are needed to increase productivity per hectare to feed the ever rising population.

4.2 HISTORICAL DEVELOPMENT

Different dynasties had promulgated rules which had influence on the agriculture. During the domain of Arabs, taxes were laid on land in the form of two-fifths produce or in cash. Later in the regime of Alauddin, the revenue was fixed at one-half of the produce, however the charges were calculated on the basis of standard yields. Agriculture suffered due to framing of rules not favourable to farming community. The produce was collected and kept under storage by the rulers. The agriculture was encouraged by Ghiasuddin Tughlak (1321-1325). The taxes in the form of land revenue were reduced. The land revenues were settled upon principle which was not more than one-tenth of the produce. Granaries were established to store grains for long periods. During the time of Mohammed bin Tughlak, Sultan used to posses best fertile land and to enhance the productivity resources were used officially. The private cultivators were again taxed heavily which put negative influence on the agriculture. According to Ibn Batuta (1325-1354), work on reclamation of waste land was started along with State farming. Wells were digged and cultivators were given loans. The rotation of crop was also initiated. Attention was given on planting various economical fruit trees. Firoz Shah Tughlak (1351-1388) introduced Jagir system by giving lands to the actual owners. The canal system for irrigation was introduced and Western Yamuna canal was constructed to use the flood water in 1355. Tax was introduced on irrigation water. The barren land became usable for agriculture.
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Land revenue assessment system varied in different states as per order of the ruler, usually based on the type of land under cultivation—whether wet, dry or garden land. The revenue was collected both in kind or cash. Sher Shah made new rules for land revenue assessment based on measurement of land, the produce and kind of grain. One third of the produce was going to the State as land revenue in kind or cash.

During Akbar's period (1555-1605), Todar Mal made reforms in revenue system by obtaining correct measurement of the land; ascertained the quality of the produce and settlement on equivalent in money. The productivity based on fertility was also considered. Tax on fruit gardens was also introduced.

Taquavi loans were allowed to cultivators for the purchase of seed and cattle on surety for their payment. Repayment was made at first harvest and remaining by the next. The cultivators who were cultivating the land personally were given permanent and hereditary occupancy of the land he tilled.

Later the burden of taxation increased on cultivators which resulted in revolts. As a result, the Zamindari system was abolished during 1669-1710 in East Punjab. Hastings in 1772 changed the revenue system according to which, lands were allotted to farmers for five years and Pattas were given which lead to permanent settlement but the cultivators and their tenants remained to live in distress.

During the British regime attempts were made to boost up the agricultural production. General improvement made in transport like rail system, promotion of export of some agricultural commodities, introduction of land tenure system also helped the agriculture in general. Department of Agriculture was created by the Government of India in 1871 which was followed by the State Governments. In 1943 All India Policy on Agriculture was drafted. As a result of Bengal famine in 1942, efforts were made to increase the agricultural production in the country. Several steps were taken up to improve agriculture at pre-independence era.

Check Your Progress 1

Note: a) Use the spaces given below for your answers.

b) Check your answer with those given at the end of the unit.

1) What influence the dynasties have on agriculture in India?

2) How advancement in transport system influenced agricultural development?
4.3 LAND REFORMS

At the time of independence three types of land tenure systems prevailed in the country; the Zamindari, Mahelwari and Rytwari. They differed in mode of payment of land revenue. Zamindari and Mahelwari have exploited farmers as it created a class of Zamindars who did not cultivate the land themselves but were getting the cultivation done by labour. Such labour depended on Zamindars for dwellings, food and other needs. After independence the land reforms were basically taken to stop exploitation of actual tillers of the soil with the following objectives.

i) To remove impediments to increase agricultural production as were faced in the past.

ii) To eliminate all types of exploitations and social injustice within the agrarian system to provide security to the actual tillers of soil and assure equality of status and opportunity to all sections of the rural population.

Attempts were made to abolish the role of intermediaries; to reform the tenancy conditions by making regulation of rent, security of tenure and ownership rights to tenants; to redistribute the land; to consolidate land holdings and to introduce cooperative farming. Ceiling on agricultural holdings was done. A statutory limit on the area of land an individual can posse was fixed including existing holdings and future acquisition. This is based on local conditions of the states in economical or uneconomical lands. The land ceiling is helpful in providing land to landless persons who may work with better zeal and produce more by increasing the productivity. The fallow land is brought under cultivation. Cooperative farming has also been followed for better production. This has been a big step in improving the socio-economic conditions of village people.

4.4 GREEN REVOLUTION

A team of experts sponsored by the ford foundation was invited by the Government of India in the later half of the second five year plan to suggest ways and means to increase agricultural production and productivity. The necessity was realized due to the need to increase agricultural production in the face of continuing stagnation of production on one hand and rapidly increasing demand on the other. The team submitted its report entitled “Indian food crises and steps to meet” in April 1959. This report suggested increasing production and productivity in some selected regions of the country with emphasis on use of modern inputs like fertilizers, credit, marketing facilities etc. The government introduced an Intensive Development Programme in seven selected districts of seven states in 1960 and this programme was named as IADP (Intensive Area Development Programme). The selected districts under IADP were required to have assured irrigation, minimum hazards like floods, drought and soil erosion, use of fertilizers, plant protection measures and easy availability of agricultural credit. The programme was implemented in West Godavari (AP), Shahabad (Bihar), Raipur (MP), Thanjavur (Tamil Nadu), Ludhiana (Punjab), Aligarh (UP) and Pali (Rajasthan). The first four were selected for rice, the next two for wheat and last one for millets. Eight more districts were added in 1962-63. This programme was later extended to all States by selecting one district from each State for intensive development. In October 1965, the programme was widened to 114 districts out of 325, in the name of Intensive Agricultural Area Programme.
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The period of mid sixties was very significant from the point of view of agriculture. New high yielding varieties of wheat were developed in Mexico by Prof. Narman Borlaug and his associates. As a result of this, production of wheat per hectare rose to the high level of 5000 to 6000 kg in Mexico in 1965. Taiwan also recorded almost similar yield. These High Yielding Varieties (HYV) required proper irrigation facilities and extensive use of fertilizers and pesticides. Accordingly, these were introduced in the form of a package programme. Dwarf high yielding varieties of wheat like Kalyan Sona and Sonalika were developed using ‘Norin’ dwarfing gene. In 1965 on the initiation of Sh. C. Subramaniam the Minister of Food and Agriculture 250 tonnes of wheat seed of important varieties Lerma Rojo 64 and Sonora 64 were imported from Mexico. The area under dwarf high yielding varieties of wheat was increased from 4 ha in 1964 to 4 m ha in 1971. This could give 20 to 30 per cent more yield. The farming area was continuously expanded and multiple crop cultivation was encouraged.

The term green revolution was coined in 1960s when improved varieties of wheat resulted in quite high yields as they were more responsive to controlled irrigation, chemical fertilizers and better plant protection measures. Later, new high yielding varieties of rice and maize were also developed increasing the yields tremendously. This was followed by continued expansion of farming areas and double cropping system. The value of seed with improved genetics was realized. The green revolution resulted in a record production of 131 million tonnes in 1978-79. The yield per hectare was increased by 30 per cent.

Besides advantages, the Green Revolution has created some problems. To arrange the required inputs farmers often went into debt. Many small land holders and landless farm workers migrated to urban areas. Assured irrigation has created problem of salinization, water logging and lowering of water tables in certain areas. The pesticide residue problem increased due to more use of pesticides. The Green Revolution in agriculture has affected both agricultural biodiversity and wild biodiversity negatively as it depended more on a few varieties in each crop.

4.5 CHEMICAL FERTILIZERS

Chemical fertilizer is an important input in increasing agricultural production and has played a vital role in the green revolution. By 1980, India had more than 100 fertilizer factories manufacturing urea, ammonium phosphate and potash. The utility of chemical fertilizers was realized, due to drought in 1950 and 1951, which created food shortage resulting in import of huge quantities of foodgrains. Three important fertilizer manufacturing ventures are Indian Farmers Fertilizer Cooperative Ltd. (IFFCO) (1967); National Fertilizers Limited, New Delhi (1974) and Shriram Fertilizers and Chemicals, Kota (1963-69). The installed capacity of urea has increased from 1.58 lakh tonnes in 1970-71 to 20.1 lakh tonnes in 2001-02. Similarly phosphatic fertilizers production capacity has also increased from 0.4 lakh tonnes \( P_2O_5 \) to 5.25 lakh tonnes \( P_2O_5 \). The fertilizer consumption has increased from 2 kg/ha in 1961 to 91 kg/ha in 2001 which increased the food production from 83 million tonnes to 211 million tonnes during the same period.

Emphasis is being given on bio-fertilizers like nitrogen fixing bacteria, phosphorus solubilizing bacteria, blue green algae, vermicompost etc. Organic farming is being preferred these days.
4.6 QUALITY SEEDS

In any crop production programme pathogen free quality seed is a must. Farmers used to select, save and store seeds for sowing. Issues on seeds were reviewed by a Seed Review Committee in 1968 and subsequent committees. True seed and plant parts used as seed attracted attention. Seed certification started. For quality seed production National Seed Corporation (1963) and State Farms Corporations (1969) were established. Indian Seed Act was passed in 1966 and seed rules were framed in 1968 to control quality of seed. Indian Minimum Seed Standards were fixed in 1971 which were revised in 1988. The parameters of seed quality were genetic purity, free from other crop seeds, weed seeds, inert matter, seed moisture, seed germination and seed borne pathogens. The seeds are classified into Nucleus seed, Breeder seed, Foundation seed and Certified seed. Nucleus seed is the basic seed developed by the concerned breeder. The breeder seed is produced from nucleus seed by the breeders. From breeder seed foundation seed is produced and from foundation seed, certified seed is produced. The breeder seeds are produced by agricultural universities (SAU) and institutions. The foundation and certified seeds are produced by State Seed Corporation as well as SAUs and Institutes. Seed certification is done by State Seed Certification Agencies. There are Seed Testing Laboratories in States. The seed replacement rate is 2-80 per cent in different crops but the average is only 15 per cent in the country. Efforts are being made to increase the seed replacement rate.

4.7 IRRIGATION

Water is an essential component in crop production system. The selection of crops in a region is based on the availability of water. Collection of rain water and its utilization at distant places and different times through canals is an age old practice. The area under irrigation has increased and the efforts are continuing to increase it further. In 1950 net irrigated area was 20.6 million hectare which was about 27 per cent of the total irrigation potential of the country. Large dams were constructed like Bhakra Nangal dam (1948-63), Mayurakshi Scheme on Mayurakshi river (1946-56), Hirakund Project on Mahanadi river (1948-57); Damodar Valley Project on Damodar river (1950-58); Rihand dam on Sone river (1952-62), Tungabhadra Project on Tungabhadra river (1945-54); Kakrapara Project on Tapti river (1949-55) etc. A number of large dams are still under construction on important rivers. They not only provide water for irrigation but are also used for electricity generation.

Irrigation is being done through open wells and tube wells also. Small and large water sheds are made in villages or a group of villages to collect rain water and use it in Kharif and Rabi season as per need. Sprinkler and drip irrigation systems have been evolved to have better water use efficiency. It is particularly helpful in undulating rainfed areas.

About 70 million hectare area is irrigated but 2/3rd area is still rainfed and efforts are continued to use available water further. Projects on joining of rivers are being planned to have better utilization of available water.
4.8 FARM IMPLEMENTS

In early days, farmers used to develop implements as per need. They used ploughs, hoes, sickles etc., which are modified from time to time. Their place has been taken over by farm machines like tractors, cultivators, seed drills, harvesters, thresher, combine harvesters etc. Machines have been developed looking to the need of special crops like sugarcane, potato, groundnut etc., for planting as well as harvesting. For seed industry, special machinery has been developed for processing, cleaning, storage, packaging etc. Production of tractors started in 1961-62 in India and later several manufacturing units started working. The mechanization enabled farmers to change their cropping pattern preferring more profitable crops.

Check Your Progress 2

Note:  a) Use the spaces given below for your answers.
      b) Check your answer with those given at the end of the unit.

1) Why high quality seed is necessary in crop production?

2) What is the role of chemical fertilizers in crop production?

3) How more area could be covered under irrigation?

4.9 AGRICULTURAL PRICES

The cultivators were exploited by merchants as they gave the minimum price for their produce. At harvest, the merchants used to dictate the price, purchased at cheap price, retained the produce and sold at higher price later. Looking to the input cost on fertilizers, improved seed, farm equipments, intercultural operations etc., agriculture became a commercial enterprise. Agricultural prices commission
was established in 1965, now renamed as Commission for Agriculture Costs and
Prices (CACP) with the function to fix support price in advance of the harvest for
all major crops. Based on the increase in cost of inputs, the support price is
increased accordingly year wise. The food corporation of India was formed in
1965 to procure, store, transport, distribute and control the sale of foodgrains.
This helped the cultivators in selling their produce at reasonable price.

4.10 AGRICULTURAL EDUCATION,
RESEARCH AND EXTENSION

To educate people in agricultural production aspects and to bring further
improvement in technology, agriculture colleges were opened. Agriculture colleges
were established at Pune in 1905 for diploma course and degree in B.Ag. was
started in 1908, Coimbatore in 1906 followed by Sabour, Kanpur, Nagpur and
Layallpur (Now in Pakistan). An Imperial Agricultural Research Institute was
established at Pusa (Bihar). Mr. Henry Phipps of USA made a generous donation
of 30,000 pound for the Institute. The name PUSA came from Mr. Phipps and
USA the country he belonged. In 1948, there were 17 agricultural colleges in
India. University Education Commission (1949) headed by Dr. S. Radhakrishnan
recommended establishment of rural universities and Land - Grant College
Philosophy of USA was introduced. During 1960-65, seven State Agricultural
Universities came into existence and now are 43.

Due to earthquake on 14th January 1934, the buildings of Imperial Agricultural
Research Institute of Pusa were destroyed, and it was shifted to New Delhi in
1945 and later renamed as Indian Agricultural Research Institute. All the branches
of agriculture like Genetics, Plant Breeding, Agronomy, Soil Science, Horticulture,
Vegetables, Plant Pathology, Entomology, Agricultural Economics, Extension,
Statistics, Biotechnology, Physiology, Seed Technology, Post Harvest Technology,
Agricultural Engineering are there in the form of Divisions.

The universities, deemed universities, colleges and institutes undertake research
work as curricular research as well as basic and applied research on different
problems.

Extension activities are also undertaken to transfer the developed technology to
cultivators for use in field. Lab to land programme is followed. Demonstrations
are laid on farmers’ field on newly developed technologies so that they may be
adopted by them. Trainings are organized for agricultural officers as well as
cultivators. This has helped in increasing the agricultural production. Booklets,
handouts, pamphlets

- Indian Council of Agricultural Research (ICAR)

Imperial Council of Agricultural Research was constituted to promote, guide and
coordinate agricultural research in the country, to impart training to researchers
and to provide scholarships for students. It included animal husbandry as well.
The resolution was passed on 23 May, 1929. After independence, the Imperial
word was replaced by Indian.

At present, ICAR is headed by Director General, supported by Deputy Director
Generals and Assistant Director Generals. There are National Institutes on crops
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National Research Centres are for Groundnut (Junagharh), Sorghum (Hyderabad) and Soybean (Indore). Project Directorates are for Rice (Hyderabad), Oilseeds (Hyderabad), Wheat (Karnal), Maize (New Delhi), Rapeseed & mustard (Bharatpur). In Horticultural Crops, National Institutes are for Mango (Lucknow), Tuber crops (Thiruvananthapuram), Horticultural Research (Hassarghatta), Plantation crops (Kasargod), Potato (Shimla), Arid Horticulture (Bikaner), Temperate Horticulture (Srinagar), Spices (Marikunnu) and Vegetables (Varanasi). The National Research Centres are for Citrus (Nagpur), Mushroom (Solan), Cashewnut (Puttur), Oil palm (Padaregi), Orchids (Sikkim), Grapes (Pune), Banana (Trichy), Onion and Garlic (Pune), Medicinal and Aromatic plants (Anand) and Seed species (Ajmer). Some other centres are NBPGR (New Delhi), NCIPM (New Delhi), Biotechnology (New Delhi), Finger Printing (New Delhi), Biological Control (Bangalore), Weed Science (Jabalpur); and NBAIM (Mhow). In all there are 48 institutes including four with deemed university status, five National Bureau, 30 National Research Centres and 12 Project Directorates.

Eighty two All India Coordinated Research Projects in the crops are running in different agro-climatic regions to find the varieties and production technology suited to specific areas. There are main centres, sub centres and verifying centres as per need.

- **State Agricultural Universities (SAUs)**

There are 43 State Agricultural Universities and one Central Agricultural University (CAU). Some States have one and some more than one Agricultural University. The CAU is located at Imphal (Manipur). It has colleges with different functions in North Eastern States. All the agricultural universities have faculties as per need and facilities to cover different aspects of agriculture.

- **Krishi Vigyan Kendra (KVKs)**

KVKs have been established to cater the immediate need of farmers as well as to keep them updated with new technology developed on various crops and allied areas. There are 536 KVKs in the country and the effort is to have one in each district in the country. Most KVKs are with agricultural universities, whereas some are with other agencies including Non-Government Organizations.

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Check Your Progress 3

**Note:**

a) Use the spaces given below for your answers.

b) Check your answer with those given at the end of the unit.

1) What is the role of education in agricultural development in the country?

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2) Why research is essential in agricultural sector?

3) How a good strong extension programme is helpful in increasing crop productivity?

4.11 ANIMAL HUSBANDRY

Animal Husbandry is a part of integrated agricultural system. Dairy, poultry, fisheries, goats and sheep are closely associated with agriculture.

i) Dairy

Cattle were indispensable in past and even today; they have importance as they are used in agricultural practices like ploughing, sowing, interculture, threshing operations and transport through bullock carts etc. Cows provide milk. Development of cattle was both for milk as well as for draught capacity. Some Indian breeds of cattle are excellent. They are classified into milch breed, general utility breed and draught breed.

India is the largest milk producing country in the world. About 70 million households are engaged in dairy. Cooperative dairy units are very strong. Earlier, the dairy depended on the crop residues and other left over and by products as feed, but now grains and other required nutrients are being provided. The livestock efficiency has been increased by introducing new breeds and hybridization programme. The upkeep of livestock has experienced vast advancement. Buffaloes are also being given the same attention. Handling of milk is highly scientific and is being transported to long distances. National Dairy Development Board through Operation Flood programme not only made India self sufficient in milk and milk products but started exporting to other countries. This is named as White Revolution. The operation flood was implemented in phases through cooperatives from 1970 when 20 million tonnes was the production. In 1980 it got increased to 50 and in 2003 to 89 million tonnes. Dairy industry has developed most successfully.

ii) Poultry

Poultry includes domestic fowls which are reared for their flesh, eggs and feathers like chickens, ducks, geese, turkeys, guinea fowls, pigeons etc. However, usually chickens have gained greater importance as poultry. Much advancement has been made in chickens to home breeds with more egg laying capacity and tender flesh. Poultries are now hand managed as well as fully mechanized.
India is the second largest producer of eggs and one of the largest broiler producers in the world. The country has developed the essential technology and capability of providing required inputs for poultry farming.

iii) Fisheries

Fisheries have received great attention as a large number of population depends on fishes of sea shores, river banks, large tanks etc. Excellent development has taken place in advancement of fisheries from egg management to full development and post harvest technology. The fishes are of various kinds like cat fish, mullets, dorab, herrings, pomfrets, shrimps, tuna etc. The total fish production in 2001-02 was 6.3 million tonnes with about 3 million tonnes marine fish from coastal areas as well as deep sea and 3.3 million tonnes from inland areas. Fresh water aquaculture has gained great importance in the country with a production of more than 3 million tonnes.

iv) Goats and Sheep

Goats and sheep are important component in agricultural enterprise. Goats reproduce fast and can live on sparse vegetation and extreme climatic conditions. They are good for arid and semi arid zones. They provide meat, skin, milk and manure. Sheep are useful for getting wool. ‘Chegu’ an inhabitant of temperate region like Himachal Pradesh and Uttarakhand is famous for very soft, fine and warm fibre called ‘Pashmina’. Another breed Changthangi of Leh region also produces similar fine fibre. The long fibres of ‘Gaddi’ and Marwadi sheep are used for making rugs, ropes etc. In India more than 20 well defined breeds of goat exist besides some regional goats. Barbari and Jamunapari from UP, Beetal from Punjab, Surati from Gujarat, ‘Sirohi’ from Rajasthan, Kannaiaadu from Tamil Nadu are some important breed used for different purposes. Efforts are being made for further advancements and improvements.

Check Your Progress 4

Note:  a) Use the spaces given below for your answers.

b) Check your answer with those given at the end of the unit.

1) How animal husbandry is a part of integrated agricultural system?

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2) How poultry could achieve the present status in the country?

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4.12 GLOBALIZATION OF AGRICULTURE

The agricultural development strategy followed in India is based on improved high yielding varieties of crops, assured irrigation, use of fertilizers, better plant protection measures, dependable post-harvest technology, improved storage facilities, value added products and better market facilities. On all these fronts international cooperation and coordination is a must. International Board for Plant Genetic Resources (IBPGR) was established in 1974 with FAO at Rome as headquarters, to collect, conserve, evaluate and document the biodiversity and to supply the germplasm to countries on request. In India, National Bureau of Plant Genetic Resources (NBPGR) New Delhi has been assigned this work and has linkages with more than 85 countries. This Bureau caters the need of agricultural and horticultural crops. Forest Research Institute, Dehradun has the responsibility of forest plants and Botanical Survey of India for other economic plants. International Institutes are established for various crops and regions.

Their main function is to evolve varieties for high yields, resistance to biotic and abiotic factors, better production technology and plant protection measures, to have trials under different agro-climatic situations and supply seed and know how to different nations. Biotechnological approach has been used to develop genetically modified plants.

Regulations are made by individual countries for trade of agricultural commodities. In India, Destructive Insects and Pests Act 1914 was promulgated by the Directorate of Plant Protection, Quarantine and Storage, Ministry of Agriculture and Irrigation. Revisions were made in 1976 and later. For imports into India, 1984 Plants, fruits and seeds regulation of imports was imposed which was revised in 1989 (Seed Tech News 30 (3, 4) 2000: 34-53). According to it, no consignment can be imported into the country without an official ‘Import permit’ and Phyto-sanitary Certificate issued by the official Plant Quarantine Agency of the exporting country. As international trade on agricultural and allied products involves risks of spread of diseases, insect-pests, weeds and unwanted chemical residues which may result in health hazards of plants, animals and pollute the environment, each country has its own rules and regulations of quarantine. Due to the want of harmony in the rules and regulation and their implementation the General Agreement on Tariffs and Trade (GATT) which was operative from 1947 and revised in 1995 was transformed into the World Trade Organization (WTO). India is a member country of WTO. WTO made an agreement on the application of sanitary and phyto-sanitary (SPS) measures uniformly applicable to all the member countries.

The agreement also includes the trade related aspects like Intellectual Property Rights and Trade in Counterfeit Goods known as TRIPS agreement. The point of subsidies is of great concern for developing countries.
The techniques developed in other countries are being used in our country in agricultural production like drip irrigation from Israel. Excellent cooperation is desired at global level to improve agricultural production. Similar efforts are made in animal husbandry to have better production in milk, poultry, piggery, fisheries etc.

4.14 LET US SUM UP

The agricultural development took place in several phases in all the components of agriculture. The agriculture was governed by age old practices which were modified and refined from time to time. Different dynasties had their influence. The cultivators were to pay high taxes in cash or kind. The Zamindari system had its influence in negative way as zamindars were not the actual cultivators and cultivation was done by labour. The Zamindars had large land holdings. The method of land assessment was modified by the rulers. After independence land ceiling was introduced and several land reforms were made. Several commissions were formed to suggest methods for agricultural advancement and betterment of farmers. The introduction of dwarf wheat from Mexico changed the scenario of wheat cultivation. Some lessons were learnt due to Bengal famine in 1942. Intensive Area Development Programme was started which gradually covered whole India. Steps were taken to establish factories for chemical fertilizers, pesticides and other requirements in agriculture production. Proper attention was given to quality seed. Irrigation facilities were increased by constructing large and small dams. They were also used for generating power. The farm implements were modified and farm machineries were introduced. Attention was given for agricultural education, research and extension through Agricultural Universities and Institutes. Indian Council of Agricultural Research is responsible for all the activities in education, research and extension in all the disciplines of agriculture. Similar attention has been given to animal sciences including dairy, poultry, fisheries, goats, sheep and pigs. Advances are also being made through biotechnology. The planning has been made to boost the agricultural production not only for self sufficiency but also to have a good export quantum.

4.15 KEY WORDS

CACP (Commission for Agricultural Costs and Prices) : Main functions of CACP is to fix support price in advance of the harvest for all major crops based on the cost of production and some incentive over the cost.

GATT : General Agreement on Tariffs and Trade.

IADP : The selected districts under IADP (Intensive Area Development Programme) were required to have assured irrigation, minimum hazard like flood, drought and soil erosion, use of fertilizers, plant protection measures and availability of agricultural credit.

Nucleus Seed : It is basic seed developed by the concerned breeder.

SPS : Sanitary and phyto-sanitary measures.

Taquavi Loan : Loan given to the cultivators for purchase of seed and cattle on surety for their payment.
4.16 SOME USEFUL BOOKS / REFERENCES


4.17 ANSWERS/HINTS TO CHECK YOUR PROGRESS

Check Your Progress 1
1) Dynasties with the frequent change of land revenue system had adverse impact on agricultural development.
2) It makes faster movement of products from one place to another.

Check Your Progress 2
1) High quality seed gives higher yield and quality product.
2) Chemical fertilizers help in achieving higher yield.
3) Through development of irrigation facilities and efficient utilization of available irrigation water.

Check Your Progress 3
1) Education helps in overall development of agriculture (development of technology and its transfer to the farmers, purchase and sale of agricultural inputs and output, etc.)
2) Research is the basic requirements of development of new technology and refinement in the existing one.
3) Good extension programme helps in transfer and propagation of improved crop production technologies among the producers.

Check Your Progress 4
1) Crop production and animal husbandry are complementary enterprises.
2) Through new breeds along with other poultry development activities.
3) Fish breeding, better management of production system, development of conditioned storage system, processing.