AGRICULTURE

CHAPTER COVERAGE

- Types of farming
- Major crops, Food Crops other than grains
- Non food crops
- Contribution of Agriculture to National Economy
- Cropping Pattern
- Horticulture crops/Sericulture crops
- Technological and Institutional Reform

Agriculture

The term agriculture is derived from two latin words, *ager* meaning land and *cultur* meaning cultivation.

In modern days agriculture also includes Animal Husbandry, Forestry and Pisiculture.

Definition :

The art and science of cultivating soil, raising crops and rearing livestock including fishing and forest.

Importance of Agriculture :

1. Two thirds of the population is dependent on agriculture.
2. It generates large scale employment.
3. It provides raw materials to many agrobased industries.
4. Export of agricultural products earns valuable foreign exchange.
5. It contributes to 26 % of GDP.

Types of Agriculture in India

1. Primitive Subsistence Farming or Shifting Agriculture:

(a) This agriculture is practiced on small patches of land with the help of primitive tools like hoe, and digging stick and family/community labour.

(b) Farming depends upon monsoons, natural fertility of the soil and suitability of the other environmental conditions.

(c) It is a 'slash and burn' agriculture. Farmers clear a patch of land and produce food crops to sustain their family.

(d) When the soil fertility decreases, the farmers shift and clear a fresh patch of land for cultivation.

(e) Nature replenishes the fertility of the soil through natural processes.

(f) Farmers do not use manure, fertilizer or other modern inputs.

(g) It is known by different names in different parts of the country.

(a) Jhumming - Assam, Meghalaya, Mizoram, Nagaland.

(b) Pamlou - Manipur

(c) Dipa - Bastar (Chattisgarh) and Andaman and Nicobar Island.

2. Intensive Subsistence Farming :

(a) Fields are very small.

(b) There is intensive use of land due to high pressure of population on the agriculture land

(c) Cropping pattern is dominated by food crops.

(d) More than one crop is grown in the same field.

(e) Farmers apply modern inputs to obtain high yield.

(f) It is a labour intensive farming.

3. Commercial Farming :

1. Use of higher dose of modern inputs eg. HYV seeds, chemical fertilizers, insecticides and pesticides.
2. The degree of commercialisation of agriculture varies from one region to another. e.g. Rice is commercial crop in Haryana and Punjab but in Orissa, it is subsistence crop.

4. Plantation Farming :

1. It is also a type of commercial farming.
2. A single crop is grown on a large area.
3. It has an interface of agriculture and industry.
4. It is done over large tracts of land using capital intensive inputs.
5. All the produce is used as raw material is respective industries.
6. The production is mainly for marked.
7. A well developed network of transport and communication connecting the plantation areas, processing industry and market is important.
8. Example of plantation crops are Tea, Coffee, Rubber, Sugarcane, Banana etc.

➢ Agriculture Seasons

1. Rabi Crops :

(a) Rabi crops are sown in winter from October to December.

(b) Harvested in summer from April to June.

(c) Example of Rabi crops are wheat, barley, peas, gram and mustard etc.

(d) Region : Punjab, Haryana, Himachal Pradesh, Jammu & Kashmir, Uttar Pradesh and Uttranchal.

Factor responsible for growth of Rabi crops.

1. Availability of precipitation due to western disturbances.
2. Fertile alluvial traits deposited by rivers from north.
3. Success of green revolution.

2. Kharif Crops :

(a) The crops which are sown with the onset of monsoon and harvested in September - October.

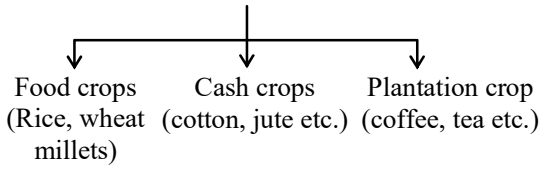
(b) Rice, maize, jowar, bajra, moong, cotton, jute, groundnut are some of the important kharif crops.

(c) Important rice growing regions are Assam, West Bengal, Coastal region of Orissa, Andhra Pradesh, Tamil Nadu, Kerala and Maharashtra.

(d) In states like Assam, West Bengal and Orissa three crops of paddy are grown in a year. There are Aus, Aman and Boro.

3. Zaid :

1. The crops which are grown in between rabi and the kharif crops are known as Zaid crops.
2. Watermelon, cucumber, vegetables and fodder crops are example of Zaid crops.



➢ Food Crops of India

1. Rice :

Features :

1. It is the staple food crop of the people living in eastern and sourthern parts of India.
2. In the north it is a kharif crop and in the south it grows with the help of irrigation throughout the year.
3. India is the second largest producer of rice in the world after China.

Geographical Requirements :

1. **Temperature :** Above 25ºC (Sowing, growing and harvesting)
2. **Rainfall :**
   (a) Annual rainfall above 100 cm.
   (b) The field must be flooded with water at the time of transplanation and during early stage of growth.
   (c) Frequent showers before ripening ensure larger grain size.
3. **Soil :** It can grow in variety of soils including silts, loam and gravels. But it grows best in alluvial soil.
4. **Area of production :** West Bengal, Andhra Pradesh, Uttar Pradesh, Bihar, Punjab, Orissa, Karnataka.

2. Wheat :

Features :

1. Second most important cereal crop.
2. Main food in north and north-western part of the country.
3. India is the fourth largest producer of wheat in the world.
4. It is a Rabi crop. (winter crop).
5. It grows well in a cool and moist climate, fertile soil, moderate rain fall.

Geographical Requirements :

1. **Temperature :**
   10ºC to 15ºC during growing season.
   25ºC to 28º C at the time of ripening.
2. **Rainfall :**
   (a) 50 cm to 75 cm
   (b) The western disturbances cause light rainfall is highly benefical to the wheat crop.

3. **Soil :**
   (a) Well drained fertile soil, heavy textured soil with some amount of lime.
   (b) Clayey, loamy soil of the Ganga Plain.
   (c) Black soil of Deccan Plateau.
4. **Area of Production :** Uttar Pradesh, Punjab and Haryana are major producer of wheat. Rajasthan, Madhya Pradesh, Gujarat and Maharashtra etc are others.

3. Millets :

Features :

1. Jowar, bajara and ragi are important millets grown in India.
2. It is the common name for several species of the grass family.
3. It is known as coarse grain.
4. They have very high nutritional value.

Jowar :

(a) It is third important food crop of India.

(b) It is a rain fed crop which can be grown in the arid areas.

(c) It needs less irrigation.

(d) Maharashtra, Karnataka, Andhra Pradesh are the leading producer of Jowar.

Bajara :

(a) It is a dry crop.

(b) It grows well in sandy and shallow black soil.

(c) Rajasthan is the largest producer of Bajara.

(e) Uttar Pradesh, Maharashtra, Gujarat and Haryana are other state.

Ragi :

(a) It is a crop of dry regions.

(b) It grows well on red, black, sandy, loamy and shallow black soil.

(c) It is very rich in iron, calcium and roughage.

(d) Karnataka is the largest producer of ragi followed by Tamil Nadu, Himachal Pradesh, Uttaranchal, Sikkim, Jharkhand and Arunachal Pradesh.

Maize :

1. It is also a coarse grain.
2. It is used both as food and fodder crop. It is a Kharif crop.
3. Temperature : 21ºC to 27ºC, Soil : old alluvial soil.
4. Major producing state : Karnataka, U.P., Bihar, Andhra Pradesh, M.P.
5. In Bihar it is grown in rabi-season.

4. Pulses :

Features :

1. India is the largest producer as well as the consumer of pulses in the world.
2. Major source of protein in a vegetarian diet.

3. Being leguminous crops, all these crops except Arhar help in restoring soil fertility by fixing nitrogen from the air.
4. Tuar, Urad and Moong are grown as Kharif crops.
5. Masur, peas and gram are grown as Rabi crops.

Geographical Requirements :

1. **Temperature :** 20ºC to 30ºC
2. **Soil :**
    1. Grown in all types of soil.
    2. Dry soil is most suitable.
3. **Rainfall :**
    1. Low to moderate rainfall
    2. 25 cm to 50 cm
    3. Too much rain fall after sowing and during flowering is damaging.
4. **Area of Production :** Punjab, Haryana, U.P., M.P., Rajasthan, Maharashtra and Bihar.

➢ Food Crops Other Than Grains

1. Sugarcane :

Features :

1. It is a tropical as well as sub tropical crop.
2. It belongs to the grass family.
3. India is the second largest producer of sugarcane only after Brazil.
4. It is the main source of sugar, gur, khandsari and molasses.

Geographical Requirements :

1. **Temperature :**
    1. Hot and humid climate
    2. 21ºC to 27ºC
    3. Coal temperature is needed at the time of ripening.
2. **Rainfall :**
    1. 75 cm to 100 cm.
    2. 100 heavy rain fall results in low sugar content.
3. **Soil :**
    1. It can grow in variety of soils like black alluvial, loamy and reddish loam.
    2. The best soil is alluvial soil of the Ganga plain and black soil of Southern India.
4. **Areas of Production :**
    1. Uttar Pradesh is largest producer of sugar cane. Bihar, Punjab and Haryana are other states.
    2. Maharashtra, Karnataka, Tamil Nadu and Andhra Pradesh are the states of Peninsular India.

2. Oil seeds :

Features :

1. India is the largest producer of oil seeds in the world.
2. Different oilseeds are grown covering approximately 12 % of the total cropped area of the country.
3. Main oil seeds are ground nut, mustard, coconut, Sesamum (til), soyabean, castor seeds, cotton seeds, linseeds and sunflower.
4. Groundnut is a Kharif crop and is produced in Andhra Pradesh, Tamil Nadu, Karnataka, Gujarat and Maharashtra.
5. Linseed and Mustard are rabi crops.
6. Sesamum is a Kharif crop in north and rabi crop in south India.
7. Castor seed is grown both as Rabi & Kharif crop.

➢ Economic Importance of Oil Seeds

1. Most of these are edible and used as cooking medium.
2. Extracted oil is also used as raw material for manufacturing large number of items.
3. Oil cake which is the by-product, obtained after the extraction of oil from oil seeds is excellent cattle feed.
4. Oil cake is also used as fertilizer.

➢ Bevarages-Crops

1. Tea :

Features :

1. It is an important beverage crop introduced in India initially by the British.
2. Tea is a labour-intensive industry.
3. It requires abundant, cheap and skilled labour.
4. Tea is processed within the tea garden to restore its freshness.
5. India is the leading producer as well as exporter of tea in the world.

Geographical Requirements :

1. **Temperature :**
    1. Tropical and sub tropical climate.
    2. Warm and moist frost free climate all throughout the year.
    3. 20ºC to 35ºC but 25ºC is ideal temp.
2. **Rainfall :**
    1. Heavy rainfall
    2. 150 cm – 250 cm
    3. The rainfall should be distributed throughout the year.
3. **Soil :**
    1. Light loamy soil

2. Rich in humus and iron content
3. Frequent use of chemical fertilizers and manure is essential.

4. **Area of Production :**

Assam, hills of Darjeeling and Jalpaiguri, West Bengal, Tamil Nadu, Kerala, Himachal Pradesh, Uttaranchal, Meghalaya, Andhra Pradesh and Tripura.

2. Coffee :

Features :

1. Indian coffee is known in the world for its good quality.
2. Arabica quality of coffee is grown in India.
3. It is one of the oldest plantation crop in India.

Geographical Requirements :

1. **Temperature :**
   1. Monthly temperature from 14ºC – 26ºC.
   2. Bright sunlight and warm weather.
   3. Frost free climate.
2. **Rainfall :**
   1. 125 cm – 250 cm.
   2. It should be well distributed throughout the year.
   3. Stagnant water is harmful.
3. **Soil :**
   1. It grows well in deep, porous soil with high humus content.
   2. In India coffee is grown on red and laterite soil.
3. **Area of Production :**

Nilgiri in Karnataka, Kerala and Tamil Nadu.

➢ Horticulture Crops

1. India is the largest producer of fruits and vegetables in the world.
2. India is the producer of tropical as well as temperate fruits.
3. Mangoes are found in Andhra Pradesh, West Bengal and U.P.
4. Oranges in Nagpur and Cherrapunji (Meghalaya).
5. Bananas in Kerala, Mizoram, Tamil Nadu and Maharastra.
6. Lichi and Guava in U.P. and Bihar.
7. Pineapples in Meghalaya.
8. Grapes in Andhra Pradesh and Maharastra.
9. Apples, Pears, Apricots and Walnuts in Jammu & Kashmir and Himachal Pradesh.
10. India produces 13 % of the world's vegetable. It is an important producer of pea, onion, cabbage and cauliflower.

➢ Non-Food Crops

Rubber :

Features :

1. It is an equatorial crop.
2. It is also grown in tropical or sub tropical areas.
3. It is a kind of natural plastic with many invaluable qualities such as elasticity, non conduction of electricity.
4. It is an important industrial raw material.
5. India ranks fifth among the world's natural rubber producers.

Geographical Requirements :

1. **Temperature :** Above 25ºC
2. **Rainfall :**
    1. It needs well and heavy distributed rainfall.
    2. 200 cm – 400 cm.
3. **Soil :**
    1. Alluvial or Laterite soil.
4. **Area of Production :**
    1. Kerala is the largest producer of rubber.
    2. Kerala account for about 91 %. of the total area under rubber plantation.
    3. Tamil Nadu, Karnataka and Andman and Nicobar Island and Garo hills of Himalayas are the other producers.

Fibre Crops :

Features :

1. Four major crops of India are :

    1. Cotton 2. Jute 3. Hemp 4. Natural silk
2. Cotton, Jute and Hemp are derived from the crops grown in soil.
3. Natural silk is obtained from cocoons of the silk worms, fed on green leaves specially mulberry.
4. Rearing of silk worm for the production of silk is known as sericulture.

Cotton :

Features :

1. It is the most important fibre crop of India.
2. It is one of the basic raw materials for the cotton textile industry.
3. India is the third largest producer of cotton in the world after China, U.S.A. and Rusia.
4. It is the crop of tropical and sub-tropical areas.
5. It is cultivated as a Kharif crop and requires 6 to 8 months to mature.

Geographical Requirements :

1. **Temperature :**
    1. Needs warm climate
    2. 21ºC – 27ºC

3. Abundant sunshine is necessary during the growth of the plant.
4. 210 frost free days.

2. **Rainfall :**
    1. It requires light rainfall.
    2. 50 cm to 80 cm is adequate.
    3. With the help of irrigation crop can be grow.
3. **Soil :**
    1. It grows well in Black cotton soil which is found in drier parts of the Deccan plateau.
    2. It also grow well in alluvial soils of Satluj Ganga Basin.
4. **Area of Production :**

    Gujarat, Maharashtra, Andhra Pradesh, Punjab, Haryana, Karnataka, Tamil Nadu and Madhya Pradesh.

Jute :

Features :

1. It is known as the golden fibre.
2. It is a tropical fibre crop.
3. India earns valuable foreign exhange by exporting jute.
4. Jute is used in making gunny bags, nuts, ropes, yarn, carpet and other ornamental artefacts.
5. Due to high cost, it is losing market to synthetic fibres and packing materials, particularly Nylon.

Geographical Requirements :

1. **Temperature :** High temperature is required during the time of growth.
2. **Soil :** Well drained fertile soil.
3. **Area of production :** West Bengal, Bihar, Assam Orissa and Meghalaya are major jute producing state.

I	II	III	IV	V	VI
Crops	**Temperature**	**Rainfall**	**Soil**	**Area and State**	**Main Features**
Rice (Kharif)	High above 25°C. High humidity	Above 100 cm (heavy)	Alluvial soil with clayey subsoil.	Tamil Nadu, West Bengal Andhra Pradesh, Bihar and Punjab. Highest Yield : Tamil Nadu. Largest producers : West Bengal.	India is the second largest producer. It is the staple food crop of a majority of the people in India.
Wheat (Rabi)	Growing stage Cool Ripening bright sunshine	50cm-75cm well distributed	Alluvial and black soil	Uttar Pradesh, Punjab, Haryana. Highest yield: Uttar Pradesh	It is the second most important cereal crop. Main food crop in north and north- western part of the country
Maize(Kharif)	21°C - 27°C Cannot stand frost at any stage	50 cm -100 cm Sunshine Promotes growth	Nitrogen-rich loamy soil	Karnataka, Uttar Pradesh, Bihar, Madhya Pradesh, Rajasthan and Punjab.	Used as food and fodder

Millets 1. Jowar 2. Bajra 3. Ragi	Survives high temperature and drought conditions	50cm-120cm Known as "dry crops", as they do not require much rain.	Sandy and black soil	(i) Jowar-Maharashtra (ii) Bajra - Rajasthan (iii) Ragi - Karnataka	Jowar, ragi and bajra are the main millets grown in India
Pulses	20°C-30°C	50-75cm	Dry, light soil.	Madhya Pradesh, Uttar Pradesh, Rajasthan and Maharashtra.	These are the main sources of protein and restore soil fertility.
Sugarcane (Kharif)	21°-27°C Tropical as well as subtropical crop.	75-150 cm.	Well-drained Alluvial soil	Uttar Pradesh, Andhra Pradesh, Haryana	India is the second largest producer of sugarcane
Cotton (Kharif)	21°C-27°C 210 frost free days	50-80 cm well distributed	Light, well-drained Alluvial soil, Black Cotton soil	Gujarat, Maharashtra, Punjab, Madhya Pradesh and Tamil Nadu	India is the third largest producer of cotton.
Jute (Kharif)	27°C-34°C.	170-200 cm	Alluvial soil found in flood plains and deltas of rivers	West Bengal, Bihar, Orissa, Assam. W. Bengal is the largest producer of jute.	It is known as the 'golden fibre
Tea	20ºC-30°C.	150-250 cm	Deep and fertile well drained soil rich in humus and organic matter.	Assam hills, West Bengal (Darjeeling),Himachal Pradesh, Arunachal Pradesh, Nilgiris, and the Anamalai hills.	India is largest grower of tea.
Coffee	18°C-28°C.	125-200 cm. well distributed.	Loamy soil with humus on well-drained hills. Red and laterite soil.	Karnataka, Tamil Nadu and Kerala. Karnataka is the largest producer of Coffee.	The Arabica variety is produced in India.
Rubber	Above 25°C.	More than 200 cm	Deep, alluvial soil with good drainage.	Kerala, Tamil Nadu and Karnataka.	It is an important industrial raw material

➢ Factors Responsible for low productivity in India

1. Over Crowding in agriculture :

There are two many people who depend on agriculture. Since 1901 the proportion of people dependent on agriculture has almost remained constant i.e. 70 %.

2. Problems of Inputs :

Indian agriculture has suffered because of the inadequancy of finance, seeds, fertilizers, marketing and transportation etc.

3. Size of land Holding :

The average size of holding in India is very low, less than 2 hectares or 5 acres. Small sized holdings lead to great waste of time, labour and cattle power.

4. Pattern of Land Tenure :

Under the Zamindari system the cultivator was only a tenant who could be turned out of the land. The cultivator has to pay high rents for the land he cultivates and he has no security of tenancy and may be turned out of his land at any time the land lords desire.

5. Poor Techniques of Production :

The Indian farmers have been using old and inefficient methods and techniques of production. There is also a shortage of various kinds of inputs like HYV seeds, fertilizer, pesticides etc.

➢ Technical & Institutional Reforms

1. Land Reforms :

In order to encourage agriculture government has abolished Zamindari system. Consolidation of fields has also been done. To help the landless workers government has granted them fields.

2. Launching of Irrigation Schemes :

Many multipurpose projects have been constructed to provide power and irrigation facilities to the farmer.

3. Subsidies :

Government is providing subsidies on the agriculture inputs. At present maximum subsidy is being given on fertilizers.

4. Free Power :

Certain states are providing free electricity to the farmers to enhance the agriculture production.

5. Public Procurement System & Agriculture price commission :

In this system declares the price of agriculture product in advance to check the exploitation of farmers by middle men.

6. HYV Seeds & Agriculture Universities :

Goverment is providing HYV seeds to the farmers. Special seminars are also being held. Many new Agriculture Universities have been set up.

7. Crops Insurances & Agriculture Finance :

Indian agriculture is mainly dependent on nature, crops are also being insured due to high risk. Government has established special banks to provide agricultural loans to farmers.

➢ Contribution of Agriculture to the National Economy, Employment and output

Agriculture has been the back bone of Indian economy though its share in the GDP is declining. Yet its share is providing employment and livelihood continues to be as high as 63 % in 2001.

Steps taken by Indian government to modernise agriculture efforts.

1. Establishment of Indian council of Agricultural Research (ICAR).
2. Agricultural Universities.
3. Veterinary services and animal breeding centres.
4. Horticulture development.
5. Research, Weather forecast.
6. Improvement of the rural infrastructure.

Draw back of Indian government.

1. Government is reducing investment in agriculture sector mainly in irrigation, power, rural roads, market and mechanisation.
2. Subsidy on fertilizers has decreased.
3. Reduction in import duties on agricultural products have proved harmful to agriculture in the country.

GLOSSARY

1. **Agriculture :** The art and science of a cultivating soil, raising crops and rearing livestock including fishing and forest.
2. **Commercial Agriculture :** Farming in which farmer grow the crop with the aim of selling it in the market.
3. **Dry Farming :** Dry farming is adopted to scanty rain fall areas. Such types of crops are grown which require less irrigation facilities.
4. **Extensive Agriculture :** Agriculture in which the farmer tries to get the greatest out put by bringing more and more new land areas under cultivation.
5. **Green Revolution :** A break through in seed technology which has led to a considerable increase in agricultural production especially in wheat as a result of better inputs.
6. **Horticulture :** Intensive cultivation of vegtetables, fruits and flowers.
7. **Intensive Agriculture :** Increase in the agriculture production by using scientific methods and better agricultural inputs.
8. **Kharif season :** It is an agricultural cropping season from early June to October. e.g. Rice, millets etc.
9. **Plantation Agriculture :** A large scale farming of one crop resembling factory production based on capital investment and application of modern science and technology in cultivating, processing and marketing the final products.
10. **Rabi season :** It is an agricultural cropping season from November to May e.g. wheat, gram, oilseeds etc.
11. **Minimum Support Price :** It is the minimum and reasonable price fixed by the government at which the farmer can sell his produce either in the open market or to the government agencies.
12. **Shifting Agriculture :** It is that type of agriculture in which farmers clear forest land and uses it for growing crops. When the fertility of the soil decreases the farmer shifts to new land.
13. **Subsistence Agriculture :** Farming in which the main production is consumed by the farmers house hold.
14. **Blue Revolution :** A package programme introduced to increase the production of fish and fish product.
15. **Sericulture :** Rearing of silk-worms to produce raw silk.
16. **Zaid :** It is a short season summer crop where fruits like watermelon and vegetables like cucumber are grown.

Production of Wheat (Million Tonnes)

Year	Wheat
1965-66	10
1970-71	24
1980-81	36
1990-91	55
2000-01	70

INDIA : Food grains output (Million-Tonnes)

Grain	1990-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
Rice	89.7	85.0	93.3	71.8	88.3	85.3	87.88
Wheat	76.9	69.7	72.8	65.8	72.1	72.0	72.73
Coarse	30.3	31.1	33.4	26.1	38.1	33.9	34.35
Pulses	13.4	11.1	13.4	1.1	14.9	13.4	13.14
Total	209.8	196.8	212.9	174.8	213.5	204.6	206.21

Percentage of house hold with “Hunger” in India

Year	Seasonal	Types of Hunger	
Rural		**Chronic**	**Total**
1983	16.2	2.3	18.5
1983-1994	4.2	0.9	5.1
1999-2000	2.6	0.7	3.3
Urban			
1983	5.6	0.8	6.4
1993-1994	1.1	0.5	1.6
1999-2000	0.6	0.3	0.9