

MODERNISING AGRICULTURE

POST INDEPENDENCE DEVELOPMENTS IN AGRICULTURE

Since independence great efforts are being made to revolutionize Indian agriculture. The state governments have abolished the Zamindari system wherever and in which ever form it existed. In most cases, the tenant has been made more secure. In many states the ownership of land has been passed on to the tiller from the absentee landlord. A maximum limit to which a farmer can own a piece of land has been fixed to ensure an equitable distribution of land. This is popularly known as the ceiling on land holdings. Steps have been taken to check fragmentation of agricultural land. The consolidation of land holdings has been one of these steps.

In some parts measures such as bunding contour ploughing and other techniques of dry farming have been initiated to conserve water and soil. The last one, namely dry farming, is very y important sine large parts of the country receive scanty rains and do not possess any irrigation facilities. Besides, the major irrigation projects minor irrigation schemes have been undertaken at local level. The use of manures and fertilizers is being encouraged.

The government has also set up a few large mechanized State farms. The most well known being the Swzafgarh farm in Rajasthan. It has also set up several demonstration farms to propagate the use of new implements, improved seeds and efforts towards developing and new high-yielding varieties, particularly in wheat have succeeded in bringing about a breakthrough in Indian agriculture. This success, although of a limited nature is popularly known as the green revolution. In some selected areas, programmes of intensive agriculture have been initiated by making available the maximum possible facilities to the farmers in the area these are known as package programmes. Schemes to protect plants for pests and diseases and to control locusts have also been launched in some parts. Multipurpose societies and cooperative banks have been set up in rural areas for the benefit of farmers. Marketing facilities have also been extended to them.

The government announces minimum support prices for the major cereals before the commencement f each agricultural season to encourage farmers to produce these on a large scale. It has set up the food corporation of India for purchasing food grins.

The growing rural awareness and the proposed crop insurance setup will further accelerate the growth of agriculture in India.

PROBLEMS CONFRONTING INDIA AGRICULTURE

The major problems confronting Indian agriculture are those of population pressure, small holdings, depleted soils, lack of modern technology and poor facilities for storage. These problems are briefly discussed as under:-

1. **Population Pressure:-** The greatest problem of Indian agriculture is that it has to bear tremendous pressure of population . India has a huge population of over one billion and it is increasing at a very fast rate. According to 2001 census figures, the overall density of population is 324 persons per sq km. this is likely to increase further in future. This has created a great demand for land. Every bit of land, including the marginal and less fertile land has been cut in to terraces for cultivation. Forests have been mercilessly cut to provide land for cultivation. The per capita availability of land is desperately low at one fifth of a hectare.

2. **Small and Fragmented Land Holdings:-** The pressure of increasing population and the practice of dividing land equally among the heirs has caused excessive sub division of farm holdings. Consequently the holdings are small and fragmented.

The small size of holdings makes farming activity uneconomical and leads to social tension, violence and discontentment. Being too small, our holdings do not permit farm mechanization and hinder the adoption of modern techniques. Therefore, our agriculture is

MODERNISING AGRICULTURE

basically characterized by subsistence farming in which the farm product is just sufficient to feed the farmer and his family. There is practically no surplus for sale. Indian agriculture has therefore stagnated for decades.

3. **Depleted Soils:-** Indian soils have been used for growing crops for thousands of years which have resulted in the depletion of soil fertility. With deforestation the sources of maintaining natural fertility of soil have been drying out. Lack of material resources and ignorance of scientific knowledge have further depleted the soils of natural fertility.

4. **Inadequate Irrigation Facility:-** By and large the irrigation facilities available in India are far from adequate. So far half of the total area under food crops has been brought under irrigation and the remaining half is left to the mercy of monsoon rains which are erratic in time and space.

5. **Farm Implements:-** Although some mechanization of farming has taken place in some of the country most of the farmers are poor and do not have enough resources to purchase modern farm implements and tools. This hampers the development of agriculture.

6. **Storage of Food grains:-** Storage of food grains is a big problem. Nearly 10 percent of our harvest goes waste every year in the absence of proper storage facilities. This colossal wastage can be avoided by developing scientific warehousing facilities. The government has taken several steps to provide storage facilities.

STEPS TO IMPROVE AGRICULTURE IN INDIA

Several steps have been taken to improve agriculture in India. Some of the steps are detailed as follows:

1. **Abolition of Zamindari:-** At the time of independence, Zamindari system prevailed under which vast stretches of land were owned by big landlords known as Zamindars. These Zamindars used to exploit the farmers who used to till the land as tenants. The government took legislative measures to abolish Zamindars system helping peasants to be land owners.
2. **Consolidation of Holdings:-** The government has promoted consolidation of scattered and small holdings in to bigger or single holdings thus making them economically viable. The consolidation of small land holdings into larger holdings is called **Chakbandi**.
3. **Cooperative Movement:-** Farmers are encouraged to adopt cooperative farming. This means that they pool their land and resources, cultivate their small holdings as one large unit and share the production proportionately.
4. **Agricultural Tools and Implements:-** Agricultural tools and implements play an important role in maximizing agricultural output and cutting down the time required for different farm operations such as sowing, weeding, spraying ,irrigating, watering and storing.
5. **Seeds:-** Farmers are given high yielding varieties of seeds at subsidized rates. This programme has helped the farmers to get bumper crops our scientists have spared no pains in developing such seeds. They have put in years experimentation under differing soil and climatic conditions.
6. **Fertilizers and other Chemicals:-** It has already been mentioned that animals waste is not enough to maintain the fertility of soil. Chemical fertilizers have become very popular for maintaining and increasing the soil fertility. Government provides chemical fertilizers to the farmers at subsidized rates. Facilities for soil testing are also made available to the farmers.
7. **Irrigation:-** Irrigation is a vital input in Indian farming because the rainfall by the monsoon winds is seasonal and undependable. Strenuous efforts have been made to

MODERNISING AGRICULTURE

increase irrigation facilities after independence. With sustained and systematic development of irrigator, irrigation potential has increased from 22.6 million hectares in 1951 to about 94.73 million hectares in 1999-2000. The total potential is expected to rise to about 113 million hectares by the year 2010.

8. **Agricultural Practices:-** Practices of multiple cropping, intercropping, strip cropping and rotation of crops ensure better crop yields besides maintain the fertility of the soil.
9. **Institutional Help:-** There are district level banks to promote agricultural development. Nationalized banks provide loans to farmers on easy terms. National seeds corporation, National Warehousing Corporation. National Food Corporation, Indian Council of Agricultural Research, Agricultural Universities, National Dairy Board and several other institutions are trying hard to help the farmers and improve agriculture. National demonstration farms play an important role at the grass – root level.
10. **Support Prices:-** Agricultural prices Commission recommends remunerative prices for the crops. The government ensures minimum support price for various crops to avoid distress selling by the farmer. Whenever prices of crops are raised to make them remunerative the farmers respond positively by raising their production and productivity.

LAND USE

Of the total land area for which land use data are available, 44.5 percent is the net Sown area. Another 7.0 percent is marginal land that is left fallow to be cultivated generally once in two or three years. About 1.3 percent of the land is under miscellaneous tree crops and groves. Thus, nearly 54 percent of the total area is arable land. The land under forest and permanent pasture respectively is 21.3 and 4.2 percent. The area not available for cultivation is reported to 15.6 percent, leaving a very narrow margin of 5 percent are cultivable water land that can be brought under the plough with some effort. Thus there is very limited scope for bringing additional land under cultivation, especially because of the inadequacy of forests and permanent pastures. This limitation on the net sown area is, however, partially impoverished by bringing more land under irrigation and making proper use of fertilizers. In the year 1970, India had 25 million hectares of land, which was sown more than once. This was obviously possible because of irrigation facilities, which are now increasingly available. Whereas in the year 1950, only 21 million hectares of land was under irrigation. The land had risen to 30.3 million hectares by 1970. This explains why India with its monsoonal regime of rainfall lays considerable emphasis on irrigation, both for increasing the total cropped area and the yield per hectare.

AGRICULTURAL SEASONS

Agricultural operations in India begin with the arrival of the monsoon in June. There are two agricultural seasons Kharif and Rabi. The Kharif season begins with the onset of the monsoons. The important kharif crops are rice, millets maize, jute and cotton. These crops are harvested in late autumn. The Rabi season begins in autumn after the rains and the crops are harvested in late spring. The important Rabi crops are wheat gram barley, linseed and mustard.

India produces a large number of cereals such as rice, wheat barley maize and millets like jawar, bajra and ragi.

RICE

MODERNISING AGRICULTURE

Rice is the leading agricultural crop of India, accounting for nearly a fifth of the total world produce. It is the staple food crop of a vast majority of people in the eastern and southern part of the country. Although every state and union territory (U.T) has some area under rice. It is grown over as much as 23 percent of the cropped area. India stands next only to China in the production of rice. However, both India and China have to import rice to meet their own requirements.

Conditions of Growth:- Rice is principally a tropical plant requiring high temperature and humidity, but it is also grown in Punjab and Kashmir. Rice grows well in ankle deep waters. Most of the crops are raised in areas with a mean monthly temperature of 25°C and an average rainfall of 100 centimeters. It is chiefly a kharif crop.

Rice Producing Areas:- Besides coastal strips, the major rice production areas are the eastern Ganga plains, the Brahmaputra valley and parts of eastern Madhya Pradesh. Rice is grown in the drier areas with adequate irrigation facilities. In recent years Punjab with its good irrigation facilities has become one of the important rice states, so is Haryana on a somewhat smaller scale. Andhra Pradesh is called the rice bowl of India. The Godavari, the Krishna and the Kaveri deltas are known for the production of these crops every year.

Varieties:- Pusa 205, IR8, Jaya, Pudna, Ratna, Krishna and Anupurna.

Methods:- Transplantation, Broadcasting and seed-Drill.

WHEAT (*Triticum*)

Wheat is the staple food of a vast majority of people living in the north. Wheat ranks next only to rice in area and production. It is grown during winter seasons. It is grown over as much as 20% of the total area under cereals. The countries producing more wheat than India are Russia, the United States and China.

In spite of the big improvement in wheat production, the country has to import large quantities of wheat especially from the United States, mainly because of the rapid growth of its population.

Condition of Growth:- Wheat is a primary crop of mid-latitudes. However, in India it is grown in the Ganga plain during the Rabi seasons. When the temperatures are 10-15°C and rainfall 50-75 cms. Light drizzle and cloudiness during their ripening period seem to increase productivity.

Wheat Producing Areas:- Although wheat is produced in every part of the country except the southern part. It is a predominant crop of Northern India in Punjab, Haryana and Uttar Pradesh.

Varieties:- Heri Moti, Arjun, Kalyan Sona, Sonalika

COTTON

Cotton is an important fibre and cash crop of India. Cotton plantation in India is in vogue since ancient times. It is a fibre crop. It is known as the King among fibres. India is 4th largest producer of cotton in the world but here; the yield per hectare is very low. India stands next to the USA and China in the production of this crop.

Geographical Conditions:- Given below are the physical requirements of cotton cultivation

- High temperature is needed for cultivation of cotton crop. Average temperature should be between 30°C and 35°C.
- Moderate amount of rainfall is required for its cultivation. Cotton can be grown in areas with 50 to 100 cms. of rainfall.
- During the growing period of the cotton plants, the relative humidity should be high at the time of picking, the weather should be dry.

MODERNISING AGRICULTURE

- d) Cotton can be grown in many types of soils, but loamy soil is ideal for its growth. In India it is mostly grown in the black cotton soil regions of Gujrat and Maharashtra. A special feature of black soil is that it can retain moisture for a long period and the need for irrigation is minimized. In Punjab and Himalayas cotton is grown in alluvial soils.

Sowing and harvesting Periods:- in most parts of India cotton is a summer crop. It is sown from April to June and harvested in the month of September to October. In Gujrat it is sown in June and harvested in October. In T.N. it is sown in Sept. and harvested in the month of March.

Production:- As above mentioned India is the 4th biggest producer of cotton in the world. In 1978 – 79 India produced about 80 lakh bales of cotton, each weighing 170 kgs. This year the area under cotton cultivation was 50 lakh hectares, while in 1971 – 72 the production was only 6.5 million bales.

State wise distribution:- Gujrat state is the biggest producer of cotton in India. In 1978 – 79 Gujrat produced about 24 lakh bales of cotton; this was about 35% of total production of cotton in India. Punjab produces but 15% of Maharashtra 14 % of cotton in India. The other important cotton produced states of India are Haryana M.P. Karnataka, Rajasthan, T.N and A.P. Most of the cotton grown in India is of short staple type, but the cultivation of long staple American and Egyptian cotton is on the increase.

India maintains a large number of livestock as the Indian farmer largely depends on draught animals for much of his work on the farm. Infact, India leads the world in the number of cattle. Although, generally, they are not properly cared for. Very often the livestock in India is of poor quality. They consume large quantities of fodder and in return provide farm manure. They are also a source of hides and skins, which India is able to export to many other countries.

India possess 176 million heads of cattle, which is nearly 19 percent of the total world population of these nearly 72 million heads are draught bulls and 54 million (about 31 per cent of the total cattle) are milch cows. The rest being the young stock. Oxen are of great economic value because of their use as draught animals. Cows provide milk to the poor farmers although the yield per head is very low.

Cattle are the most numerous in Uttar Pradesh with Madhya Pradesh a close second. The states of Bihar Maharashtra, Rajasthan and Andhra Pradesh follow in that order. The quality of the cattle in Punjab, Haryana Uttar Pradesh, Rajasthan and Gujrat is generally good compared to other parts of the country.

India, with 40 million sheep accounts for only four percent of the world's share. Very few of these sheep yield quality wool. They are most numerous in Andhra Pradesh and Tamil Nadu. The sheep with good quality wool are reared in the western Himalayan region Jammu and Kashmir and Himachal Pradesh.

The government at the centre and state level has taken a number of steps to improve the breeds of Indian livestock.

FISHERIES

India with its long coastline has access to a potentially rich source of food-fish-to supplement the food derived from the land. Fish provide the most needed proteins at low cost. The existence of an extensive continental shelf, the ocean currents flowing along the coastline and the plankton brought down by big rivers flowing into the sea make conditions favourable for the development of fisheries. Indian fishermen, moreover, are not lacking in the spirit of adventure.

MODERNISING AGRICULTURE

Among the most common species of marine fish are herring, sardines, tunas, anchovies, shole, Indian salmon, mackerels, sharks, rays and skates. Efforts are being made to encourage mechanized fishing .cold storage and other marketing facilities are also gradually being extended. Fresh water fisheries are also important in certain parts of India like Wet Bengal, Bihar and Orissa.

ARRANGE THE FIVE MAJOR CEREALS OF INDIA IN ORDER OF THEIR PRODUCTION

The five major cereals of India in order of their production are Rice, Wheat, Jawhar, Bajra and Maize.

Distinguish between Net Sown Area and Total Cropped Area

Net Sown Area	Total Cropped Area
1. Agriculture area used for raising certain crop in a certain year is called net sown area.	1. The total sown area in a year is formed as gross-sown area. Agricultural land area with two crops is added twice to form gross sown area.
2. The extent of net sown area depends upon receipt of rains in an area.	2. Extent of gross sown area is the result of the availability of means of irrigation in the area.
3. A certain crop is raised in a certain net sown area in a year.	3. It includes intensive use of agricultural land for more than one crop in a year.

Distinguish Between Fallow Land and Waste Land

Fallow Land	Waste Land
1. Continuous fallow reduces the fertility of agricultural land unless it is recovered by adding fertilizers. The other method is to leave uncultivated for a year or a season to let the land recover its spent-up potentialities the land left uncultivated for this purpose is called the fallow land. Thus any land lying uncultivated for one season or more with the sole purpose of retaining its fertility is called the fallow land.	1. It is that piece of land which is either marshy or hilly and thus cannot be used for cultivation.
2. When sown they add to the agricultural production of the farmers. They serve as boon for them. They enhance their income	2. This land is quite useless as this land is quite useless as far as cultivation is concerned.

Write a comprehensive essay on the direction in which Indian agriculture has to move in order to feed the growing millions of India

Soon after the partition of the country India had to face a very serious problem due to the shortage of food. India had to almost beg food from every possible source mainly because most of the wheat producing areas had gone to the Pakistan side. For years together India had to struggle hard to increase her production. Where as in 1950 – 51, India produced 50.8 million tones of food grains within the next twenty years; she produced 104.7 million tones of food grains.

But all that was achieved was neutralized by the increase in population which meant by form 36.17 crores in 1951 to 68.38 crores in 1981. Thus inspite of an increase in production India continues to be deficient in food grains.

MODERNISING AGRICULTURE

Now if this massive problem of deficiency in food grains is to be solved then we will have to take drastic steps both in the direction of increasing the yield and controlling the rapid growth of population.

MEASURES TO INCREASE PRODUCTION OF FOOD GRAINS

There is very little scope of increasing the area of our cultivation land as such we will have to lay much emphasis on intensive agriculture. We will have to produce more by working hard and making use of better agriculture means in the same fields which are already under plough as no new lands are easily available. As beginning millions of the populated areas like India are to be fed, more and more of food will have to be extracted from the existing field.

As such we will have to undertake all steps which enable us to get more and more from the existing fields. This can be done by following different measures viz, consolidation of land holdings, constructing of major irrigation schemes use of manures and fertilizers, developing of high field varieties of different cereals, checking pests, diseases and locusts, settling up mechanized state farms and demonstration farms, providing more banking and marketing facilities setting up of institutions like food corporation of India and last but not the least providing electricity to each and every farming unit so that they are saved from the vagaries of the monsoons.

Why India is called predominately an agriculturist country?

India is called predominantly an agriculturist country due to the following reasons.

1. About 70% of Indians total working population is directly engaged in agriculture and 15% is indirectly engaged.
2. Except China, India has the largest population in the world, which depends agriculture for their livelihood.
3. Agriculture along with forests and fisheries form 45% of the total national income
4. It is the mainstay of the Indian economy.
5. Agriculture not only provides food to the beaming millions but also raw material for our foreign industries.
6. It is a great corner of foreign exchange.

What is the position of India in various agricultural products?

India leads the world in the tea, sugarcane and millets. It stands second in the production of rice and jute. It holds third position in tobacco and it holds fourth position in the production of the wheat and cotton.

Distinguish between Rabi and Kharif Seasons

Kharif Seasons	Rabi Seasons
1. Kharif cropping season starts from the onset of monsoon and ends up with the end of monsoon. 2. It is also called summer season 3. Crops require high temperature and high rainfall 4. Temperature Kharif crops are Rice, Jute, Cotton and Millets.	1. Rabi cropping season starts with the season of retreating monsoon and ends up with the start of summer season. 2. It is also winter season 3. Crops require low temperature and low rainfall 4. Important Rabi crops are Wheat, oilseed, gram and barley.

PLANTATION FARMING

The literal meaning of the word plantation is to plant or to grow but now this form "plantation" has a wide connotation, plantation agriculture has been recognized as a special

MODERNISING AGRICULTURE

system of growth crops, directly connected with production plantation agriculture exactly resembles the pattern of factory production wherein a single item is manufactured on a large scale. Under the system of plantation agriculture, a tree, a bush or herb is grown on a very large scale on a big land holding. produce is obtained continuously for many years. A huge capital is involved in the process. Provision is made for machinery, fertilizers and best quality seeds etc. at certain places residential accommodation are also provided to the workers near the state and a factory is established to process the agricultural produces. For plantation agriculture we need fertile land, deep and skilled labour, best management, huge capital and easy transport as essential requirement.

Plantation agriculture is possible only in the area where a long growing period is available to the crops. Hence the main plantation areas are found in the tropical and subtropical regions. Tea, Coffee, Rubber, Banana etc are plantation crop.

CONSOLIDATION OF HOLDING

Means allocation of compact plot of land exchange for the several small plots held by the owner of land.

Or

When scattered plots of agricultural land are combined together in order to make them economically viable it is called the consolidation of holdings.

DRY FARMING

A method of farming adopted in certain regions of inadequate rainfall and devoid of irrigation facilities by conserving moisture in the soil and by raising drought ending crops.

WHITE REVOLUTION

After the success of green revolution a new revolution saw light of the day. It is called white revolution. The other name given to this renovation Operation Flood. Under this programme milk production has to be increased by leaps and bounds in order to meet the growing demand of milk in the country. Improving breed of the milk animals brings this about, by providing nourishing food to them and by adopting scientific methods in milk collection.

White revolution has succeeded a lot in Kheda district of Gujrat where marginal farmers have formed milk co-operatives. They collect milk and market it to far off places like Delhi and Mumbai. It has increased their income and they have become rich.

STATE TRADING IN FOOD GRAINS

When the government itself indulges in buying and selling of food grains with a view to control prices it is called state trading in food grains.

INDIA COUNCIL OF AGRICULTURAL RESEARCH

This institution has been setup to carry on research work in the field of agriculture. This council develops better qualities of seeds and helps the farmer in use of right type of manners and fertilizers.

CEILING ON LAND HOLDINGS

Ceilings on holding means the prescribed area of land left with the zamindar after implementation of zamindari Abolition Act. The area over and above the prescribed ceiling limit is to be returned.

MODERNISING AGRICULTURE

All the states accept Nagaland and Meghalaya have passed ceiling acts. Or laws have been placed under ix schedule of the constitution, so that landlords cannot challenge it in the court of law.

The object of land ceiling was to reduce inequality. The surplus land withdrawn from landlords is given to the weaker sections of the society. 29 lakh hectares of land have been declared surplus so far. 19 lakh

Hectares of land have been actually distributed among 42 lakh landless farmers. It is a step towards economic justice.

TYPES OF FARMING

The farmers in India practice different types of farming.

1. **Subsistence Farming:-** Majority of farmers in the country practice subsistence farming it is characterized by small and scattered land holdings and use of primitive tools. As the farmers are poor, they do not use fertilizers and high yielding variety of seeds in their fields to the extent they should do. Facilities like electricity and irrigation are generally not available to them. These result into low productivity. Most of the food production is consumed by the farmers and their families.
2. **Shifting Agriculture:-** In this type agriculture, first of all a piece of forest land is cleared by felling trees and burning of trunks and branches. After the land is cleared, crops are grown for two to three years and then the land is abandoned as the fertility of the soil decreases. The farmers then move to new. Coffee next to tea, coffee is the most important beverage crop of India. At present there are over 52,000 coffee gardens in India.
3. **Conditions of Growth:-** Coffee requires hot and humid climate with temperature varying between 15°C and 25°C and rainfall from 150 to 250 cm. It grows well on well drained laterite soils of Karnataka. Tropical high lands at altitudes varying between 900 and 180 metres above sea level are best suited for this crop.
4. **Production:-** In the year 1950-51, India produced about 25,000 tonnes of coffee from about 91,000 hectares of land. The corresponding figures for 1998-99 were 2,228,00 tonnes and 3,06,000 hectares. The yield also increased from 200 kg per hectare in 1950-51 to 818 kg per hectare in 1998-99.
5. **Distribution:-** Coffee is confined to south – western part of the country. In fact southern India has virtual monopoly over coffee production. The chief coffee growing states are Karnataka, Kerala and Tamil Nadu in this very order. They produce over 99% of Indian coffee. Karnataka alone produces more than 80 percent coffee of India.
6. **Exports :-** Indian coffee is in great demand in the international market owing to its superior quality. In 1997-98, the coffee exports were 1,47,000 tonnes worth 436 million U.S. dollars.

SUGARCANE

Sugarcane is the 4th main source of sugar in India. Sugar has become a very important item of our daily food intake. Sugarcane plant is supposed to be indigenous to India.

Conditions of Growth:- Sugarcane is a tropical plant and grows well in hot and humid climate. It requires 20°C to 25°C temperature, abundant sunshine and about 100 cm annual rainfall for its successful growth. Irrigation is an important input for the cultivation of sugarcane. In fact sugarcane is the most irrigated crop in India as 88% area under this crop has irrigation facilities.

Production:- With nearly one – third of the world's sugarcane area, India is the second largest producer of sugarcane in the world after Brazil. The area under sugarcane increased

MODERNISING AGRICULTURE

from 1.7 million hectares in 1950-51 to about 4.2 million hectares in 1999-2000. The production recorded over five –fold increase from 57 million tones in 1950-51 to 299 million tones in 1999-2000. The yield per hectare also jumped from 33,422 kg to 71000 kg in the same duration.

Distribution:- Uttar Pradesh is the leading producer of sugarcane in India. This is followed by Maharashtra, Punjab, Andhra Pradesh, Bihar, Tamil and Karnataka.

Species:- Pepper, Cardamom, Cloves, Mace, Cinnamon, Ginger, Nutmeg, Cassia Etc. are collectively known as spices. Spices are used to add flavor and taste to our food. India is the world's largest producer and exporter of spices the Malabar Coast of Kerala and the Karnataka are the main producers in 1995-96 the total production of fruits was 41 million tones and that of vegetables over 70 million tones.

PULSES:- Pulses comprise an important item of protein –rich food for the Indian masses, most of whom are vegetarians. India is the largest producer as well as consumer of pulses in the world. Important pulses are grams (Chana), arhar or tur, moong, black gram (urad), lentil (masur) and peas (matar). They are grown almost all over the country except in areas of high rainfall. These are rainfed crops and do not require irrigation. Being leguminous pulses fix atmospheric nitrogen in the soil and improve its fertility. Therefore, they are grown either in rotation with cereals or inter-spaced with cereals which exhausted soil nitrogen.

The area under pulses increased from about 1.9 million hectares in 1998-99. This is the largest area in the world.

MILLETS:- Jowar, bajra and ragi are some of the important millets grown in India. Jowar is the third most important food crop both in respect of area and production. It grows in areas with a mean monthly temperature of 18 to 32°C. It requires about 30 to 60 cm of rain. Major producers are Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu and Madhya Pradesh.

BAJRA:- Is also a crop of dry and warm climate. Climatic conditions are almost similar to that required for jowar. Rajasthan is the largest producer of bajra. Other bajra producing states are Uttar Pradesh, Maharashtra, Gujarat and Haryana.

RAGI:- Is a rainfed Kharif crop, grown on well drained alluvial loams, and red or black sandy loams. It requires climatic conditions like bajra and is grown mainly in drier parts of Karnataka and Tamil Nadu.

MAIZE:- It is a coarse grain, used both as food and fodder. It is grown under varied climatic and soil conditions. It is cultivated mainly as a kharif crop. It grows well in areas of 50 -100 cm of rain and in areas of less rains, it is grown under irrigation. It grows well under temperature between 21 and 27° C . It requires well –drained fertile soils. It is grown in about four percent of the cropped area.

Major Maize Producing states are Karnataka . Uttar Pradesh Bihar Andhra Pradesh and Madhya Pradesh.

OILSEEDS:- Vegetable oil is an important item of Indian food. Oil cake, the residue after oil is extracted from the seeds, is an important cattle food; India is the largest producer of oil seeds in the world. Major oilseeds are groundnut, sesamum, rapeseed, mustard, and linseed and castor seed.

THE IMPORTANT OILSEEDS ARE

MODERNISING AGRICULTURE

- a) **Groundnut:-** Is the most important oilseed of India. It accounts for about half of the major oilseeds produced are Andhra Pradesh, Tamil Nadu, Karnataka, Gujarat and Maharashtra. These states account for about 85 percent of the national production.
- b) **Sesamum:-** (till) is a rainfed crop. It is grown as a kharif crop in the north and as a Rabi crop in the south. It is grown in almost all parts of India, but Gujarat, Tamil Nadu, West Bengal, Karnataka, and Madhya Pradesh are the major producers.
- c) **Rapeseed and mustard:-** Are two most important oilseeds of northern India. These are grown mainly as Rabi crops. Sometimes they are also raised as mixed crops. Major producers are Rajasthan, Uttar Pradesh, Haryana, West Bengal and Madhya Pradesh.
- d) **Linseed is grown as a Rabi crop:-** India is the third largest producer of linseed in the world after Russia and Canada. Madhya Pradesh, Uttar Pradesh, Bihar, Chhattisgarh and Maharashtra are the major Producers.
- e) **Caster:-** Seed is a small tree crop. It is grown both as kharif and Rabi crops. By producing one-fifth of the world total, India ranks second in the world after Brazil. Gujarat, Andhra Pradesh and Rajasthan are the main producers.

FRUITS

India is the world's second largest producer of fruits and vegetables. It leads the world in the production of mangoes and bananas. Important fruits grown in India are mango, banana, apple, cashew nut, orange, grapes, peach, pear and strawberry. Important producers of cashew nut are Kerala, Tamil Nadu and Andhra Pradesh. India is the largest exporter of cashew nut in the world.

Mango is the most important fruit, covering about 38 percent of the area under fruits. It accounts for 23 percent of the total fruit production.

SAFFRON

Is the cash crop of J & K state. It is grown in karewas of Kashmir valley and Kistawar. Saffron (*crocus sativus*) belongs to the Iris family. It is a perennial herb having adventitious roots and fairly scented flowers. Saffron is supposed to be the best flavouring and colouring agent. One kilogram of saffron contains about 5 lakh stigma parts. A 100 kgs of fresh flowers yield about 3 kgs of dehydrated stigmas.

Saffron cultivation is under taken in diffused manner throughout the valley of Kashmir.

RUBBER

Is a coherent elastic solid obtained from latex trees. It requires hot and humid climate with temperature varying from 25°C and 35°C and a well distributed annual rainfall of 300 cm. rich and well drained soils varying from laterite to fine alluvium or clayey loams are best suited to rubber tree. This is an important industrial raw material. Kerala is the largest producer of natural rubber producing over 90 percent of the total rubber of India. In 1950-51, the area under rubber cultivation was 56 thousand hectares.

TOBACCO

Tobacco is an important cash crop of India. About 30 million people depend upon tobacco for their livelihood. It grows well in warm, sub-humid climate with temperature ranging from 20°C to 30°C and annual crop and freedom from frost is very essential. Soil should be rich as the crop depletes its potash content very heavily.

MODERNISING AGRICULTURE

India is the third largest tobacco producer of the world after China and the USA and accounts for 8 percent of the world's total tobacco production. Although tobacco is grown in as many as 15 states of India, its leading producers are Andhra Pradesh and Gujarat.

HORTICULTURE

FRUITS

Cultivation of vegetables, flowers and fruits is called Horticulture. Both tropical and temperate fruits are grown in India. Among the tropical fruits are coconuts, cashewnuts, jackfruits, pineapples, bananas and oranges. India mangoes and bananas are in great demand in the international markets. Temperature fruits like apples, plums, peaches, almonds, apricots, grapes etc. are grown in plenty. Temperature fruits are grown mainly in the hill areas of Jammu and Kashmir, Himachal Pradesh, Uttarakhand and Arunachal Pradesh. Tropical fruits, on the other hand are grown in different parts of peninsular India and the Northern Plains.

CHARACTERISTICS OF INDUS CIVILIZATION

The Indus civilization is designated urban civilization. Its towns were planned properly. The roads were big and broad and they crossed at right angle. The towns were built in a modern commercial style. Each lane had wells and in the buildings there were baths. Every part of the town was divided into lanes in length and breadth. The earthen pots were kept by the side of road to be used as Dust-bin. To draw out water, deep drainage of small and big types were constructed as network in the towns. The bricks, lime and white powder were used in constructing the drainage which were covered with big stones and bricks.

ARCHITECTURE

On both sides of the lanes and the roads the buildings in a row were built of raw and baked bricks. Kitchen, bathroom, courtyard, toilets were separately built in a house. The houses were big and small being single as well as double storied. The doors opened in the lanes and not on the main roads. Almirahs were constructed in the walls. Pegs of bones and conch were fixed in the walls.

GENERAL BATH

Mohenjo-daro excavations bring to light the biggest Bath built by baked bricks. The length is 39 ft (12 meters), breadth 23 ft (7 meters) and depth is 8 ft (2.5 meters). Around it, are verandahs, plinth for bath. To reach inside are the stair-cases. The outer walls of the Bath are plastered by one inch thick Gypsum (Bitumen). In the rooms by the side of the Bath, were perhaps, the residences of the priests who used to come down for the bath on special holy occasions.

GRANNARY

The Granary of Mohenjo-daro was 45.17 meters in length and 15.23 meters in breadth. In Harappa there are 6 Granaries of 15.23 x 6.09 meters size. In its south there are round plinths (platform) for cleaning the grains. At Kalibanga, the relics of a Granary have been excavated.

SOCIAL CONDITION

Composition of Society:- The Indus society might have been divided into four classes of scholars, military men, traders and labour, among the scholars were Purohitas, Doctors, Astrologers; among the military men were the soldiers and government officials, among the

MODERNISING AGRICULTURE

traders were the commercial classes and among the labour were those who depended on their hard work.

FOOD:- The people took vegetarian and non-vegetarian food. They ate wheat (flour), rice, fruits, vegetables, apricots, water-melon, lemon, milk and curd and the dishes cooked by them. The non-vegetable diet included flesh of sheep and fish, of sheep and fish. The moulds to prepare sweets and stone implements of crush the spices 'Sil-Batta' found in excavation. Testify the fact that Indus people were fond of sweets and tasty food preparations.

CLOTHES:- Woolen and Cotton clothes were worn. Shawls like Uttariya and Adhovastra or undergarment were mainly used.

ORNAMENTS:- Necklace, armlets, bracelets, rings, ear –rings , 'chhalle'-round earprings or round wrist band, waist band, ring for nose, ring for ear, anklets etc. were made of different metals. Both men and women wore ornaments. The rich wore gold and silver and costly gems and stones, ivories etc. the poor wore ornaments made of bronze, bones, sea shells and baked bricks.

ENTERTAINMENT:- The Indus people played Chess and enjoyed music, dance and gambling. The children played with whistle, carts and other musical toys etc.

COMMUNICATION:- The Indus people used bullock carts and Ikkas pulled by one horse or bull for transport of communication.

LAST RITES :- The dead body was buried. Some burnt I on pyre and the ashes were kept in a pot and buried. Stone threw the dead for the birds and animals to eat. The remaining bones were later buried.

CONDITON OF WOMEN:- The female images and f the Goddes Matri Devi found in the excavations testify to a respectable position of women I the Indus society. Perhaps the society was matriarchal.

ECONOMIC CONDITION

Agriculture:- Wheat, Barley, Cotton, Mustard, Peas, Dates, Pomegranate etc. were grown. Wooden ploughs and stone cutters were used for agriculture. The irrigation was done through rain-water, tanks , wells and rivers.

Animal Rearing:- Animal rearing was besides agriculture, the main profession of the Indus people. They reared buffaloes, Camels oxen, sheep, asses, goats, pigs, elephants, dogs, cats etc. the remained of horses have been found in Surkotda. The scholars do not agree regarding the existence of dogs.

Occupation:- Occupations related to armaments , pots, clothe, ornaments, wood-work and various crafts were prevalent. The Indus people had commercial relation with foreign countries. The trade was conducted by land and Sea routes. The trade relation existed mainly with Mesopotamia, Afghanistan, middle Asian Countries.

Art and Craft:- The earthen pots were designed and painted in different colours with images and natural sceneries and flowers.

Stamps:- They were dexterous in engraving beautiful designs on scals (Muhar) of various metals.

MODERNISING AGRICULTURE

RELIGIOUS CONDITION

- a) **Worship of Mother Goddess (Mata Devi):-** They worshipped the female deity.
- b) **Worship of Shiva :-** In the excavations the image of a God with three heads and two horns surrounding with a lion, a elephant and a rhinoceros has been ground. Below his throne is a buffalo and below his feet are two deers. It indicates that Shiva was worshipped in the form of Pashupati Mahadev.
- c) **Worship of Linga and Yoni:-** The two images of Linga and Yoni are found in stone. The worship of these images must be on account of the recreatory powers symbolized by them.
- d) **Worship of Tees and Animals:-** The tree worshipped were Bad, Peepal , Tulsi, Amla Etc. the hunched buffalo, Snakes, Neelkanth, cow etc. were the animals and birds occasionally worshipped. They also believed in witchcraft and magic.
- e) **Idols:-** Idols were made of soft stones and grey and yellow slabs obtained by cutting he hills. The female idols are beautifully carved and adorned. A beautiful bronze female statue in a dancing posture is very artistic.
- f) **Small Terracots:-** Beautiful bronze female excavated. Terracots figurines were in vogue.
- g) **Talisman:-** Square and rectangular talismans were built in bronze. They have the figure of man or animal, on the one side and written words on the other , these Bronze talismans were used for medicinal and magic purposed.
- h) **Pearls:-** Different kinds of pearls in different moulds were used for ornaments. The round shaped 'Manakas' were cast in different materials such as Sel-Khari, Gomed, Shankmitti, ivory, gold and silver. For necklace and waist bands these 'manakas' were profusely used.
- i) **Knowledge of Script:-** The Indus people had the knowledge of script. Their script has not been deciphered so far. It was pictorial and it contains 4000 letters. The letters do reflect the symbols and suggestive points. It is written from right to left.

CAUSES OF ITS DOWNFALL

- Every year excessive rains cause extreme flood and the rivers changed the direction.
- Due to changing Monsoon, the scarcity of rains.
- The fall in standards of living of Indus people.
- The fall in foreign trade continuously.
- The animals used the pastures in excesses
- The invasion of some foreign power.

%%%%%%%%%%%% End of the Lesson %%%%%%%%%%