

1. Details of Module and its structure

Module Detail	
Subject Name	Geography
Course Name	Geography 04 (Class XII, Semester - 2)
Module Name/Title	Land resources and Agriculture – Part 2
Module Id	legy_20502
Pre-requisites	Cropping seasons, Major crops of India, Climatic conditions and soil types in different parts of the country, Green revolution, Modern farm techniques, subsistence farming, commercial farming
Objectives	After reading this lesson, learners will be able to: <ul style="list-style-type: none">• Know about the three different cropping seasons in India.• Differentiate between the Kharif, Rabi and Zaid Seasons.• Know the meaning of irrigated farming and Rainfed farming.• Differentiate between protective and productive farming.• Differentiate between dryland farming and wetland farming.• Understand the different geographical factors responsible for the better growth of different types of crops in the country.
Keywords	Cropping seasons, Kharif season, Rabi season, Zaid season, temperate and subtropical crops, agricultural year, Rainfed farming, protective irrigation, productive irrigation, dryland and wetland farming, rain water harvesting, intensive crops, aquaculture, fine grains, Coarse grains, agro-climatic regions, fodder crop

2. Development Team

Role	Name	Affiliation
National MOOC Coordinator	Prof. Amarendra P. Behera	CIET, NCERT, New Delhi
Program Coordinator	Dr. Rejaul Karim Barbhuiya	CIET, NCERT, New Delhi
Course Coordinator (CC) / PI	Prof. Tannu Malik	DESS, NCERT New Delhi
Course Co-Coordinator / Co-PI	Dr. Nidhi Gusain	CIET, NCERT, New Delhi
Subject Matter Expert (SME)	Mr. Rajeev Sinha	St. Xavier's Sr. Sec. School, Raj Niwas Marg, Delhi
Review Team	Dr. Swagata Basu	SSV (PG) College, Hapur, U.P.
Technical Team	Mr. Shobit Saxena	CIET, NCERT, New Delhi

In the previous module of this chapter we discussed about the land use and changes in the land use pattern in the country over the years. In your earlier classes you have read about the three different cropping seasons in India and the major crops grown in these seasons. Here in this module we are going to talk about the cropping seasons, types of farming and major crops grown in India in detail.

Cropping Seasons in India

There are three distinct crop seasons in the northern and interior parts of country, namely

- a) **Kharif** - The Kharif season largely coincides with Southwest Monsoon under which the cultivation of tropical crops, such as rice, cotton, jute, jowar, bajra and tur is possible.



Image: Rice

Source: [https://commons.wikimedia.org/wiki/File:Mature_Rice_\(India\)_by_Augustus_Binu.jpg](https://commons.wikimedia.org/wiki/File:Mature_Rice_(India)_by_Augustus_Binu.jpg)

- b) **Rabi** - The Rabi season begins with the onset of winter in October-November and ends in March-April. The low temperature conditions during this season facilitate the cultivation of temperate and subtropical crops such as wheat, gram and mustard.



Image: Wheat

Source: https://commons.wikimedia.org/wiki/File:Wheat_P1210892.jpg

- c) **Zaid** - Zaid is a short duration summer cropping season beginning after harvesting of Rabi crops. The cultivation of watermelons, cucumbers, vegetables and fodder crops

during this season is done on irrigated lands. However, this type of distinction in the cropping season does not exist in southern parts of the country.



Image: Watermelon

Source: https://commons.wikimedia.org/wiki/File:Piece_of_watermelon.png

Here, the temperature is high enough to grow tropical crops during any period in the year provided the soil moisture is available. Therefore, in this region same crops can be grown thrice in an agricultural year provided there is sufficient soil moisture.

Let us try to understand the three different cropping seasons in India with the help of this tabular explanation.

Table: Cropping Seasons in India		
Cropping seasons	Major Crops Cultivated	
	Northern states	Southern states
Kharif (June-September)	Rice, Cotton, Bajra, Maize, Jowar, Tur	Rice, Maize, Ragi, Jowar, Groundnut
Rabi (October – March)	Wheat, Gram, Rapeseeds and Mustard, Barley	Rice, Maize, Ragi, Groundnut, Jowar
Zaid (April–June)	Vegetables, Fruits, Fodder	Rice, Vegetables, Fodder

Types of Farming

On the basis of main source of moisture for crops, the farming can be classified as

- a) **Irrigated farming:** There is difference in the nature of irrigated farming, as well as based on the objective of irrigation, i.e., protective or productive.
 - i) **Protective irrigation:** The objective of protective irrigation is to protect the crops from adverse effects of soil moisture deficiency which often means that irrigation acts as a supplementary source of water over and above the rainfall. The strategy of this kind of irrigation is to provide soil moisture to maximum possible area.



Image: Protective irrigation

Source: <https://www.pikist.com/free-photo-innly>

- ii) **Productive irrigation:** It is meant to provide sufficient soil moisture in the cropping season to achieve high productivity. In such irrigation the water input per unit area of cultivated land is higher than protective irrigation.



Image: productive irrigation

Source: https://commons.wikimedia.org/wiki/File:Groundnut_peanut_ditch_irrigation.jpg

- b) **Rainfed farming (barani):** Rainfed farming is further classified on the basis of adequacy of soil moisture during cropping season into dryland and wetland farming.

- i) **Dryland farming:** In India, the dryland farming is largely confined to the regions having annual rainfall less than 75 cm. These regions grow hardy and drought resistant crops such as ragi, bajra, moong, gram and guar (fodder crops) and practise various measures of soil moisture conservation and rain water harvesting.



Image: dryland farming

Source: <https://commons.wikimedia.org/wiki/File:Camposcala.JPG>

- ii) **Wetland farming:** In wetland farming, the rainfall is in excess of soil moisture requirement of plants during rainy season. Such regions may face flood and soil erosion hazards. These areas grow various water intensive crops such as rice, jute and sugarcane and practise aquaculture in the fresh water bodies.



Image: wetland farming

Source: <https://www.pxfuel.com/en/free-photo-eptzt>

Now let us talk about the major foodgrains grown in the different parts of the country.

Foodgrains

India is an agriculturally important country. Two-thirds of its population is engaged in agricultural activities. Agriculture is a primary activity, which produces most of the food that we consume. Besides food grains, it also produces raw material for various industries. A large variety of crops are grown to meet the requirement of the growing population. Crops also supply raw materials for agro based industries. Major food crops are wheat, rice, maize and millets. Jute and cotton are fibre crops. Important beverage crops are tea and coffee.

Cereals

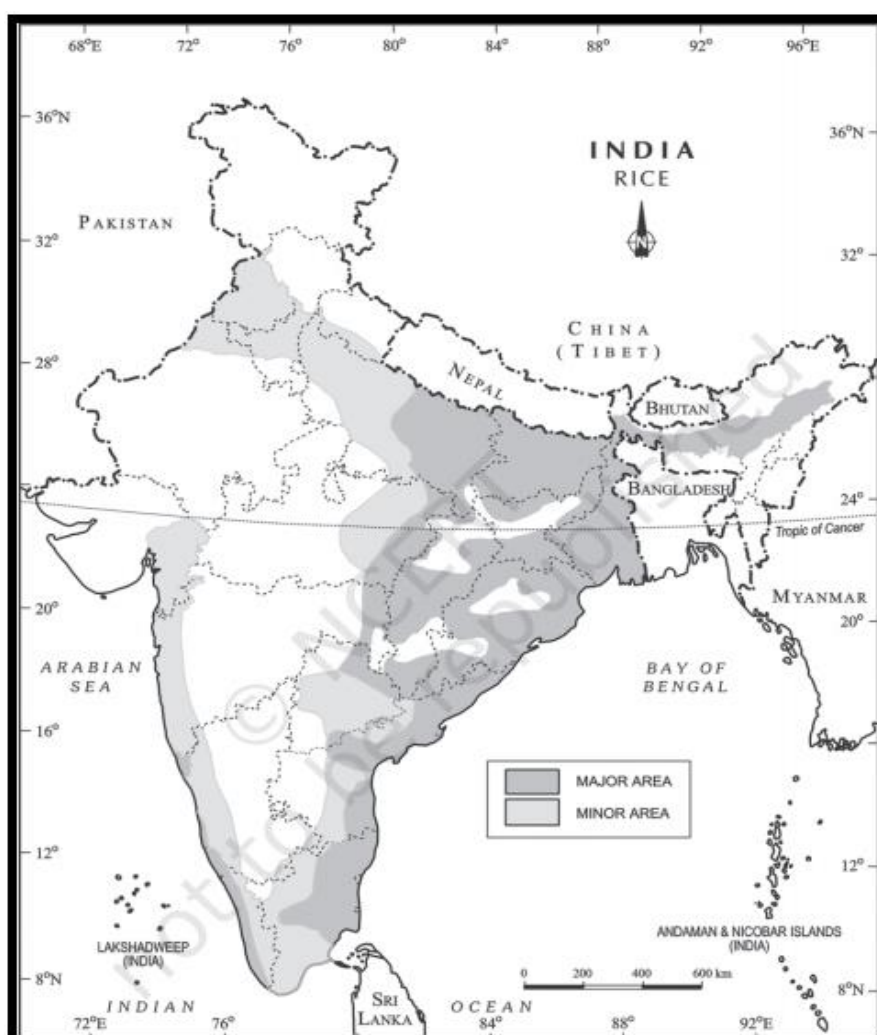
The cereals occupy about 54 per cent of total cropped area in India. The country produces about 11 per cent cereals of the world and ranks third in production after China and U.S.A. India produces a variety of cereals, which are classified as fine grains (rice, wheat) and coarse grains (jowar, bajra, maize, ragi), etc. Account of important cereals has been given in the following paragraphs:

Rice

- Rice is a staple food for the overwhelming majority of population in India. Though, it is considered to be a crop of tropical humid areas, it has about 3,000 varieties which are grown in different agro-climatic regions. These are successfully grown from sea level to about 2,000 m altitude and from humid areas in eastern India to dry but irrigated areas of Punjab, Haryana, western U.P. and northern Rajasthan.
- In southern states and West Bengal the climatic conditions allow the cultivation of two or three crops of rice in an agricultural year. In West Bengal farmers grow three crops

of rice called 'aus', 'aman' and 'boro'. But in Himalayas and northwestern parts of the country, it is grown as a Kharif crop during southwest Monsoon season.

- India contributes 21.2 per cent of rice production in the world and ranked second after China in 2015. About one-fourth of the total cropped area in the country is under rice cultivation. West Bengal, Uttar Pradesh, and Punjab were the leading rice producing states in the country in 2015-16. The yield level of rice is high in Punjab, Tamil Nadu, Haryana, Andhra Pradesh, Telangana, West Bengal and Kerala. In the first four of these states almost the entire land under rice cultivation is irrigated. Punjab and Haryana are not traditional rice growing areas.
- Rice cultivation in the irrigated areas of Punjab and Haryana was introduced in 1970s following the Green Revolution. Genetically improved varieties of seed, relatively high usage of fertilizers and pesticides and lower levels of susceptibility of the crop to pests due to dry climatic conditions are responsible for higher yield of rice in this region. The yield of this crop is very low in rainfed areas of Madhya Pradesh, Chhattisgarh and Odisha.



Map: India – Distribution of rice

Source: NCERT Textbook



Image: Rice plant



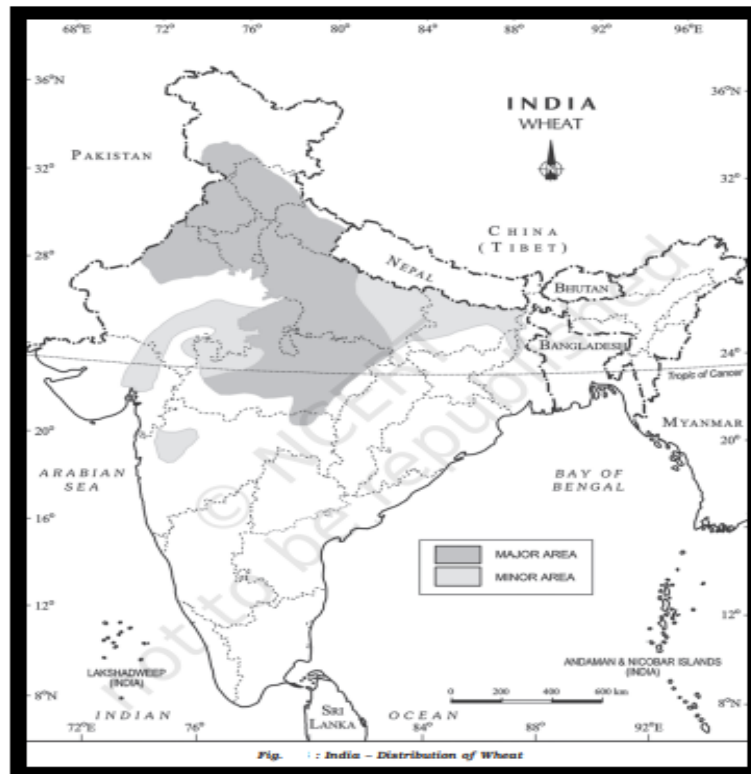
Rice

Sources: <https://pxhere.com/en/photo/1593896>

<https://www.pikrepo.com/fwtdn/rice-grains>

Wheat

- Wheat is the second most important cereal crop in India after rice. India produces about 11.7 per cent of total wheat production of world (2015). It is primarily a crop of temperate zone. Hence, its cultivation in India is done during winter i.e. Rabi season.
- About 85 per cent of total area under this crop is concentrated in north and central regions of the country i.e. Indo-Gangetic Plain, Malwa Plateau and Himalayas up to 2,700 m altitude. Being a Rabi crop, it is mostly grown under irrigated conditions. But it is a rainfed crop in Himalayan highlands and parts of Malwa plateau in Madhya Pradesh.
- About 14 per cent of the total cropped area in the country is under wheat cultivation. Uttar Pradesh, Madhya Pradesh, Punjab, Haryana and Rajasthan are leading wheat producing states. The yield level of wheat is very high (above 4,000 kg. per ha) in Punjab and Haryana whereas, Uttar Pradesh, Rajasthan and Bihar have moderate yields. The states like Madhya Pradesh, Himachal Pradesh and Jammu and Kashmir growing wheat under rainfed conditions have low yield.



Source: NCERT Textbook



Image: Wheat plant



wheat grain

Sources: https://commons.wikimedia.org/wiki/File:Wheat_P1210892.jpg
<https://pxhere.com/en/photo/1025912>

Jowar

- The coarse cereals together occupy about 16.50 per cent of total cropped area in the country. Among these, Jowar or sorghum alone accounts for about 5.3 per cent of total cropped area.
- It is main food crop in semi-arid areas of central and southern India.
- Maharashtra alone produces more than half of the total Jowar production of the country. Other leading producer states of jowar are Karnataka, Madhya Pradesh, Andhra Pradesh and Telangana.
- It is sown in both Kharif and Rabi seasons in southern states. But it is a Kharif crop in northern India where it is mostly grown as a fodder crop.

- South of Vindhyaachal it is a rainfed crop and its yield level is very low in this region.



Image: Jowar plant



Jowar grain

Sources: <https://www.needpix.com/photo/137386/jowar-sorghum-karnataka-india-agriculture-crop-grain-growth-abundance>

<https://pixabay.com/photos/sorghum-jowar-seeds-hubli-india-275258/>



Map: India – Jowar producing states

Source: <https://commons.wikimedia.org/wiki/File:Map-of-india-political-enlarge-view.gif>

(edited)

Bajra

- Bajra is sown in hot and dry climatic conditions in northwestern and western parts of the country.
- It is a hardy crop which resists frequent dry spells and drought in this region.

- It is cultivated alone as well as part of mixed cropping.
- This coarse cereal occupies about 5.2 per cent of total cropped area in the country.
- Leading producers of Bajra are the states of Maharashtra, Gujarat, Uttar Pradesh, Rajasthan and Haryana.
- Being a rainfed crop, the yield level of this crop is low in Rajasthan and fluctuates a lot from year to year.
- Yield of this crop has increased during recent years in Haryana and Gujarat due to introduction of drought resistant varieties and expansion of irrigation under it.



Image: Bajra plant



Bajra Grain

Sources: <https://www.needpix.com/photo/126737/pearl-millet-bajra-cultivation-lingsugur-raichur-karnataka>

<https://pixabay.com/photos/bajra-grain-agriculture-harvest-5324228/>



Map: India – Bajra producing states

Source: <https://commons.wikimedia.org/wiki/File:Map-of-india-political-enlarge-view.gif>
(edited)

Maize

- Maize is a food as well as fodder crop grown under semi-arid climatic conditions and over inferior soils.
- This crop occupies only about 3.6 per cent of total cropped area.
- Maize cultivation is not concentrated in any specific region. It is sown all over India except Punjab and eastern and north-eastern regions.
- The leading producers of maize are the states of Karnataka, Madhya Pradesh, Bihar, Andhra Pradesh, Telangana, Rajasthan and Uttar Pradesh.
- Yield level of maize is higher than other coarse cereals. It is high in southern states and declines towards central parts.



Image: Maize plant



Maize grain

Source: <https://pixabay.com/photos/maize-plant-corn-agriculture-food-5463051/>
<https://www.pikist.com/free-photo-vpiuh>



Map: India – Maize producing states

Source: <https://commons.wikimedia.org/wiki/File:Map-of-india-political-enlarge-view.gif>
(edited)

Pulses

- Pulses are a very important ingredient of vegetarian food as these are rich sources of proteins.
- These are leguminous crops which increase the natural fertility of soils through nitrogen fixation.
- India is a leading producer of pulses in the world.
- The cultivation of pulses in the country is largely concentrated in the drylands of Deccan and central plateaus and northwestern parts of the country.
- Pulses occupy about 11 per cent of the total cropped area in the country.
- Being the rainfed crops of drylands, the yields of pulses are low and fluctuate from year to year.
- Gram and tur are the main pulses cultivated in India.



Image: pulses

Source: https://commons.wikimedia.org/wiki/File:CSIRO_ScienceImage_3224_Pulses_and_1_egumes.jpg

Gram

- Gram is cultivated in subtropical areas.
- It is mostly a rainfed crop cultivated during Rabi season in central, western and northwestern parts of the country.
- Just one or two light showers or irrigations are required to grow this crop successfully.
- It has been displaced from the cropping pattern by wheat in Haryana, Punjab and northern Rajasthan following the green revolution.
- At present, gram covers only about 2.8 per cent of the total cropped area in the country.
- Madhya Pradesh, Uttar Pradesh, Maharashtra, Andhra Pradesh, Telangana and Rajasthan are the main producers of this pulse crop.
- The yield of this crop continues to be low and fluctuates from year to year even in irrigated areas.



Image: Gram

Source: <https://www.pikist.com/free-photo-vekvn>

Tur (Arhar)

- Tur is the second important pulse crop in the country.

-
- It is also known as red gram or pigeon pea.
 - It is cultivated over marginal lands and under rainfed conditions in the dry areas of central and southern states of the country.
 - This crop occupies only about 2 per cent of total cropped area of India.
 - Maharashtra alone contributes about one-third of the total production of Tur. Other leading producer states are Uttar Pradesh, Karnataka, Gujarat and Madhya Pradesh.
 - Per hectare output of this crop is very low and its performance is inconsistent.



Image: Tur (pigeon pea)

Source: https://www.flickr.com/photos/ajay_suresh/49683602388

Oilseeds

- The oilseeds are produced for extracting edible oils.
- Drylands of Malwa plateau, Marathwada, Gujarat, Rajasthan, Telangana, Rayalseema region of Andhra Pradesh and Karnataka plateau are oilseeds growing regions of India.
- These crops together occupy about 14 per cent of total cropped area in the country.
- Groundnut, rapeseed and mustard, soyabean and sunflower are the main oilseed crops grown in India.



Map: India – Major oilseeds

Source: <https://commons.wikimedia.org/wiki/File:Map-of-india-political-enlarge-view.gif>

(edited)

Groundnut

- India produces about 15 per cent of the total groundnut production in the world (2015).
- It is largely a rainfed Kharif crop of drylands. But in southern India, it is cultivated during Rabi season as well.
- It covers about 3.6 per cent of total cropped area in the country.
- Gujarat, Rajasthan, Tamil Nadu, Telangana, Andhra Pradesh, Karnataka and Maharashtra are the leading producers.



Map: India – Groundnut producing states

Source: <https://commons.wikimedia.org/wiki/File:Map-of-india-political-enlarge-view.gif>

(edited)

- Yield of groundnut is comparatively high in Tamil Nadu where it is partly irrigated. But its yield is low in Telangana, Andhra Pradesh and Karnataka.



Image: Groundnut

Sources: <https://pixabay.com/photos/food-healthy-nature-vegetarian-1284432/>

https://commons.wikimedia.org/wiki/File:Groundnut_kernel.JPG

Rapeseed and Mustard

- Rapeseed and mustard comprise several oilseeds as rai, sarson, toria and taramira.
- These are subtropical crops cultivated during Rabi season in north-western and central parts of India.
- These are frost sensitive crops and their yields fluctuate from year to year. But with the expansion of irrigation and improvement in seed technology, their yields have improved and stabilised to some extent.
- About two-third of the cultivated area under these crops is irrigated.
- These oilseeds together occupy only about 2.5 per cent of total cropped area in the country.
- Rajasthan contributes about one-third production while other leading producers are Haryana and Madhya Pradesh. Yields of these crops are comparatively high in Haryana and Rajasthan.



Map: India – Rapeseed and mustard producing states

Source: <https://commons.wikimedia.org/wiki/File:Map-of-india-political-enlarge-view.gif>

(edited)



Image: Mustard plant

Source: <https://pxhere.com/en/photo/1605230>

Other Oilseeds

- Soyabean and sunflower are other important oilseeds grown in India.
- Soyabean is mostly grown in Madhya Pradesh and Maharashtra. These two states together produce about 90 per cent of total output of soyabean in the country.
- Sunflower cultivation is concentrated in Karnataka, Andhra Pradesh, Telangana and adjoining areas of Maharashtra.
- It is a minor crop in northern parts of the country where its yield is high due to irrigation.



Image: sunflower

Source: <https://pxhere.com/en/photo/1599223>

<https://pixabay.com/photos/sunflower-seeds-fruits-food-vitamin-5593546/>

Fibre Crops

These crops provide us fibre for preparing cloth, bags, sacks and a number of other items. Cotton and jute are two main fibre crops grown in India.

Cotton

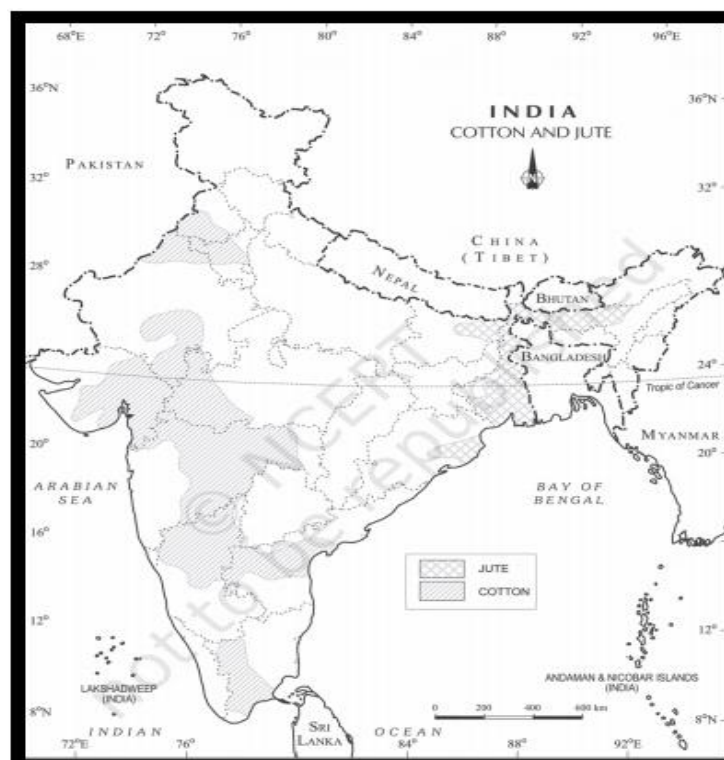
- Cotton is a tropical crop grown in Kharif season in semi-arid areas of the country.
- India lost a large proportion of cotton growing area to Pakistan during partition. However, its acreage has increased considerably during the last 50 years.

- India grows both short staple (Indian) cotton as well as long staple (American) cotton called 'narma' in north-western parts of the country.
- Cotton requires clear sky during flowering stage.
- India ranks second in the world in the production of cotton after China.
- Cotton occupies about 4.7 per cent of total cropped area in the country.
- There are three cotton growing areas, i.e. parts of Punjab, Haryana and northern Rajasthan in north-west, Gujarat and Maharashtra in the west and plateaus of Andhra Pradesh, Karnataka and Tamil Nadu in south.
- Leading producers of this crop are Gujarat, Maharashtra and Telangana. Per hectare output of cotton is high under irrigated conditions in north-western region of the country. Its yield is very low in Maharashtra where it is grown under rainfed conditions.



Image: cotton plant

Source: https://commons.wikimedia.org/wiki/File:Cotton_field_kv06.jpg



Map: India – Distribution of cotton and jute

Source: NCERT Textbook

Jute

- Jute is used for making coarse cloth, bags, sacks and decorative items.
- It is a cash crop in West Bengal and adjoining eastern parts of the country.
- India lost large jute growing areas to East Pakistan (Bangladesh) during partition.
- At present, India produces about three-fifth of jute production of the world. West Bengal accounts for about three-fourth of the production in the country. Bihar and Assam are other jute growing areas.
- Being concentrated only in a few states, this crop accounts for only about 0.5 per cent of total cropped area in the country.



Image: Jute plant

Sources: [https://commons.wikimedia.org/wiki/File:Jute_Field_Bangladesh_\(7749587518\).jpg](https://commons.wikimedia.org/wiki/File:Jute_Field_Bangladesh_(7749587518).jpg)
https://upload.wikimedia.org/wikipedia/commons/2/2a/Jute_Rope_%28%E0%AE%9A%E0%AE%A3%E0%AE%B2%E0%AF%8D_%E0%AE%95%E0%AE%AF%E0%AE%BF%E0%AE%B1%E0%AF%81%29.jpg

Other Crops

Sugarcane, tea and coffee are other important crops grown in India.

Sugarcane

- Sugarcane is a crop of tropical areas. Under rainfed conditions, it is cultivated in sub-humid and humid climates. But it is largely an irrigated crop in India.
- In Indo-Gangetic plain, its cultivation is largely concentrated in Uttar Pradesh. Sugarcane growing area in western India is spread over Maharashtra and Gujarat.
- In southern India, it is cultivated in irrigated tracts of Karnataka, Tamil Nadu, Telangana and Andhra Pradesh.

- India was the second largest producer of sugarcane after Brazil in 2015. It accounts for about 19 per cent of the world production of sugarcane. But it occupies only 2.4 per cent of total cropped area in the country.
- Uttar Pradesh produces about two-fifth of sugarcane of the country. Maharashtra, Karnataka, Tamil Nadu, and Andhra Pradesh are other leading producers of this crop where yield level of sugarcane is high. Its yield is low in northern India.



Image: Sugarcane

Sources: https://commons.wikimedia.org/wiki/File:Red_sugarcane_plant.jpg
<https://www.pikist.com/free-photo-iyjud>



Map: India – Distribution of Sugarcane

Source: NCERT Textbook

Tea

- Tea is a plantation crop used as beverage.
- Black tea leaves are fermented whereas green tea leaves are unfermented.
- Tea leaves have rich content of caffeine and tannin.
- It is an indigenous crop of hills in northern China. It is grown over undulating topography of hilly areas and well drained soils in humid and sub-humid tropics and sub-tropics.
- In India, tea plantation started in 1840s in Brahmaputra valley of Assam which still is a major tea growing area in the country. Later on, its plantation was introduced in the sub-Himalayan region of West Bengal (Darjeeling, Jalpaiguri and Cooch Behar districts). Tea is also cultivated on the lower slopes of Nilgiri and Cardamom hills in Western Ghats.
- India is a leading producer of tea and accounts for about 21.8 per cent of total production in the world 2015. India's share in the international market of tea has declined substantially. It ranks second among tea exporting countries in the world after China (2015). Assam accounts for about 53.2 per cent of the total cropped area and contributes more than half of total production of tea in the country. West Bengal and Tamil Nadu are the other leading producers of tea.



Image Tea garden

Source: https://commons.wikimedia.org/wiki/File:Female_workers_at_a_tea_Garden_of_Assam.jpg



Map: India – Distribution of Tea and coffee

Source: NCERT Textbook

Coffee

- Coffee is a tropical plantation crop.
- Its seeds are roasted, ground and are used for preparing a beverage.
- There are three varieties of coffee i.e. Arabica, Robusta and Liberica.
- India mostly grows superior quality coffee, Arabica, which is in great demand in International market.
- But India produces only about 3.7 per cent coffee of the world and ranks seventh after Brazil, Vietnam, Colombia, Indonesia, Ethiopia and Honduras in 2015.
- Coffee is cultivated in the highlands of Western Ghats in Karnataka, Kerala and Tamil Nadu. Karnataka alone accounts for more than two-third of total production of coffee in the country.



Image: coffee plant

Source: https://commons.wikimedia.org/wiki/File:Coffee_plant.jpg

Conclusion

In the end of this module it can be concluded that India is an agricultural country as majority of its population are engaged in farming activity. Different types of crops are grown in our country and that is possible due to the different climatic conditions and variety of soil types. India has three different cropping seasons – Kharif, Rabi and Zaid. In different parts of the country different types of farming is practised. India is also a large exporter of the major food grains in the world. But with the growing population there is a challenge of high production and sustainability.