

## **UNIT – II**

### **Agriculture**

**Irrigation, Types and distribution.**

**Major crops and their distribution:**

**Rice, Wheat, Sugarcane, Cotton and Groundnut.**

**Plantation Crops:**

**Tea and Coffee .**

**Agricultural Regions,**

**Green revolution,**

**Problems of Indian Agriculture.**

# AGRICULTURE

## DEFINITION:

- Agriculture is the art and science of cultivating the soil, growing crops and raising livestock.
- It includes the preparation of plant and animal products for people to use and their distribution to markets.

**IRRIGATION:** Irrigation is the process of applying water to the crops artificially to fulfil their water requirements. Nutrients may also be provided to the crops through irrigation. The various sources of water for irrigation are wells, ponds, lakes, canals, tube-wells, and even dams. Irrigation offers moisture required for growth and development, germination, and other related functions.

- The frequency, rate, amount and time of irrigation are different for different crops and also vary according to the types of soil and seasons. For example, summer crops require a higher amount of water as compared to winter crops.

# TYPES OF IRRIGATION

## The major different types of irrigation

The main sources of irrigation are –

*wells, tube-wells, rivers, ponds, lakes, dams, and canals.*

The main different types of irrigation are:

- **Surface Irrigation:**

Major and minor canals from Indian rivers, groundwater well based systems, tanks, and other rainwater harvesting projects for agricultural activities. Of these groundwater system is the largest.

- **Drip Irrigation:**

- Drip or trickle irrigation is one of the latest methods of irrigation.
- It is suitable for water scarcity and salt affected soils.
- Water is applied in the root zone of the crop.

# MAJOR CROPS AND THEIR DISTRIBUTION

## **Rice, Wheat, Sugarcane, Cotton and Groundnut.**

**Rice:** Rice is grown in varying degrees in almost all parts of the country except higher parts of the Himalayan ranges exceeding 2,500 metres in altitude, Marusthali part of Rajasthan, KachchhSaurashtra, Malwa and Marathwada regions due to various geographical constraints.

Rice producing areas mainly include the lower and the middle Ganga Plains, the east and the west Coastal Plains, the Brahmaputra valley and parts of the Peninsular plateau.

Punjab, Haryana and Uttar Pradesh have assumed considerable importance after the introduction of the Green Revolution.

It is clear that about half of rice production in India is contributed by four states namely West Bengal, Uttar Pradesh, Punjab and Andhra Pradesh.

The other major producers are **Odisha, Bihar, Chhattisgarh, Assam, Tamil Nadu, Haryana, Karnataka, Jharkhand, Madhya Pradesh, Maharashtra, Gujarat and Kerala** in order of importance.

**TABLE 22.3. State-wise Area, Production and Yield of Rice in India (2012-13)**

Sl. No.	State	Area		Production		Yield (kg/ hectare)
		Million hectares	%age of all India	Million tonnes	%age of all India	
1.	West Bengal	5.43	12.80	14.96	14.33	2,755
2.	Uttar Pradesh	5.86	13.82	14.41	13.80	2,459
3.	Punjab	2.85	6.72	11.37	10.89	3,989
4.	Andhra Pradesh including Telangana	3.49	8.23	10.91	10.45	3,126
5.	Odisha	4.03	9.50	7.64	7.32	1,896
6.	Bihar	3.25	7.66	7.34	7.03	2,258
7.	Chhattisgarh	3.78	8.91	6.61	6.33	1,749
8.	Assam	2.24	5.28	4.56	4.37	2,036
9.	Tamil Nadu	1.58	3.73	4.40	4.21	2,785
10.	Haryana	1.22	2.88	3.98	3.81	3,262
11.	Karnataka	1.27	2.99	3.28	3.14	2,583
12.	Maharashtra	1.55	3.65	3.04	2.91	1,961
13.	Jharkhand	1.35	3.18	3.03	2.90	2,244
14.	Madhya Pradesh	1.88	4.43	2.78	2.66	1,479
15.	Gujarat	0.70	1.65	1.50	1.44	2,143
16.	Kerala	0.20	0.47	0.53	0.51	2,650
	Others	1.73	4.08	4.06	3.89	@
	<b>All India</b>	<b>42.41</b>	<b>100.00</b>	<b>104.40</b>	<b>100.00</b>	<b>2,462</b>

@ — Since area/production is low in individual states, yield rate is not worked out.

Source : Agricultural Statistics at a glance, 2013, p. 68.

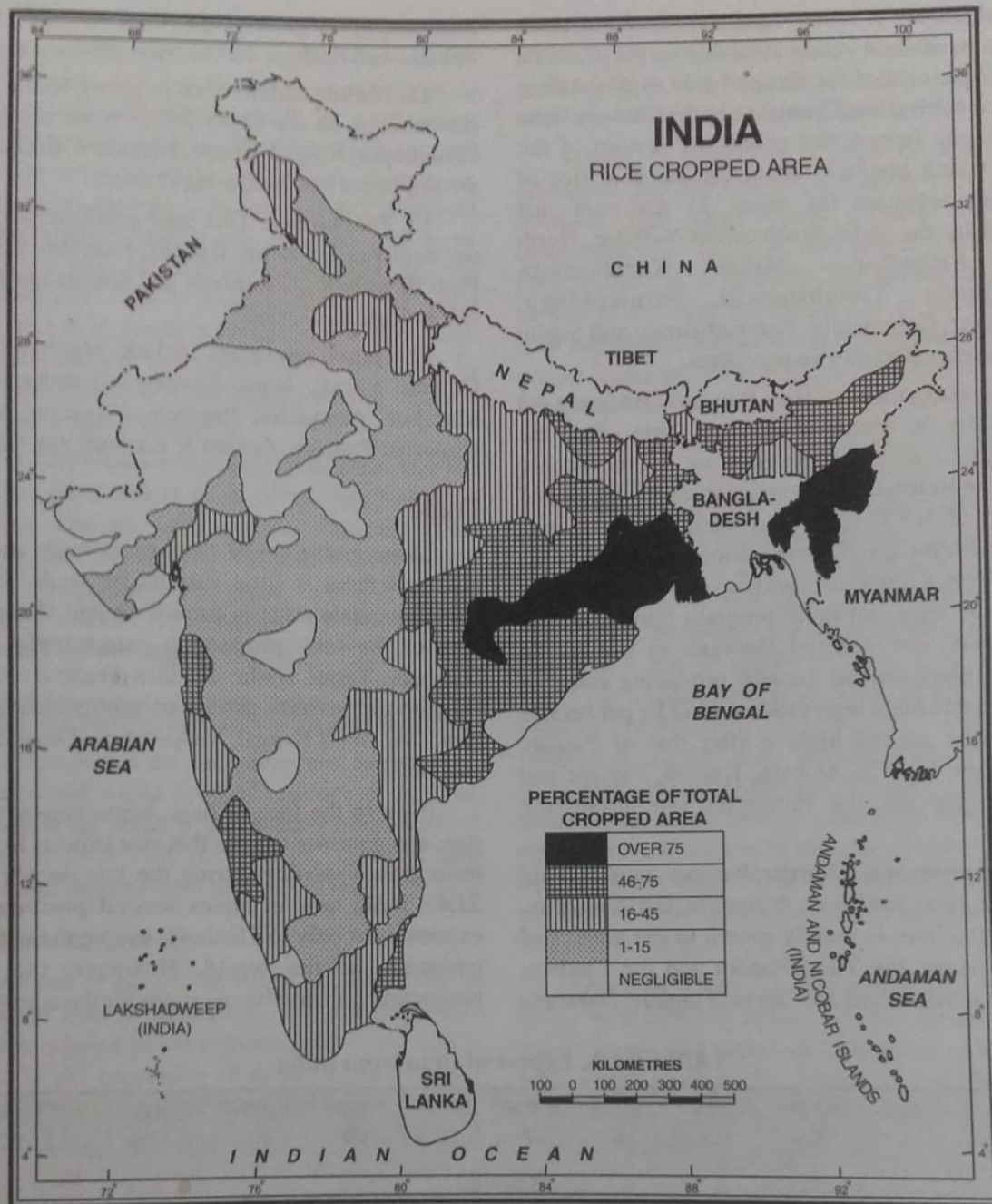


FIG. 22.1. India : Rice cropped area

## **Wheat:**

- The second most important wheat specie grown in the country.
- This specie is grown mostly under rainfed conditions in Madhya Pradesh, parts of Gujarat and Rajasthan, Maharashtra and Karnataka.
- Only recently, with the development of dwarf high yielding varieties, some area has come under dwarf durum in Punjab, central and peninsular India.
- Good quality pasta wheats suitable for macaroni, spaghetti, vermicelli and noodles are now available.

## Distribution of Wheat:

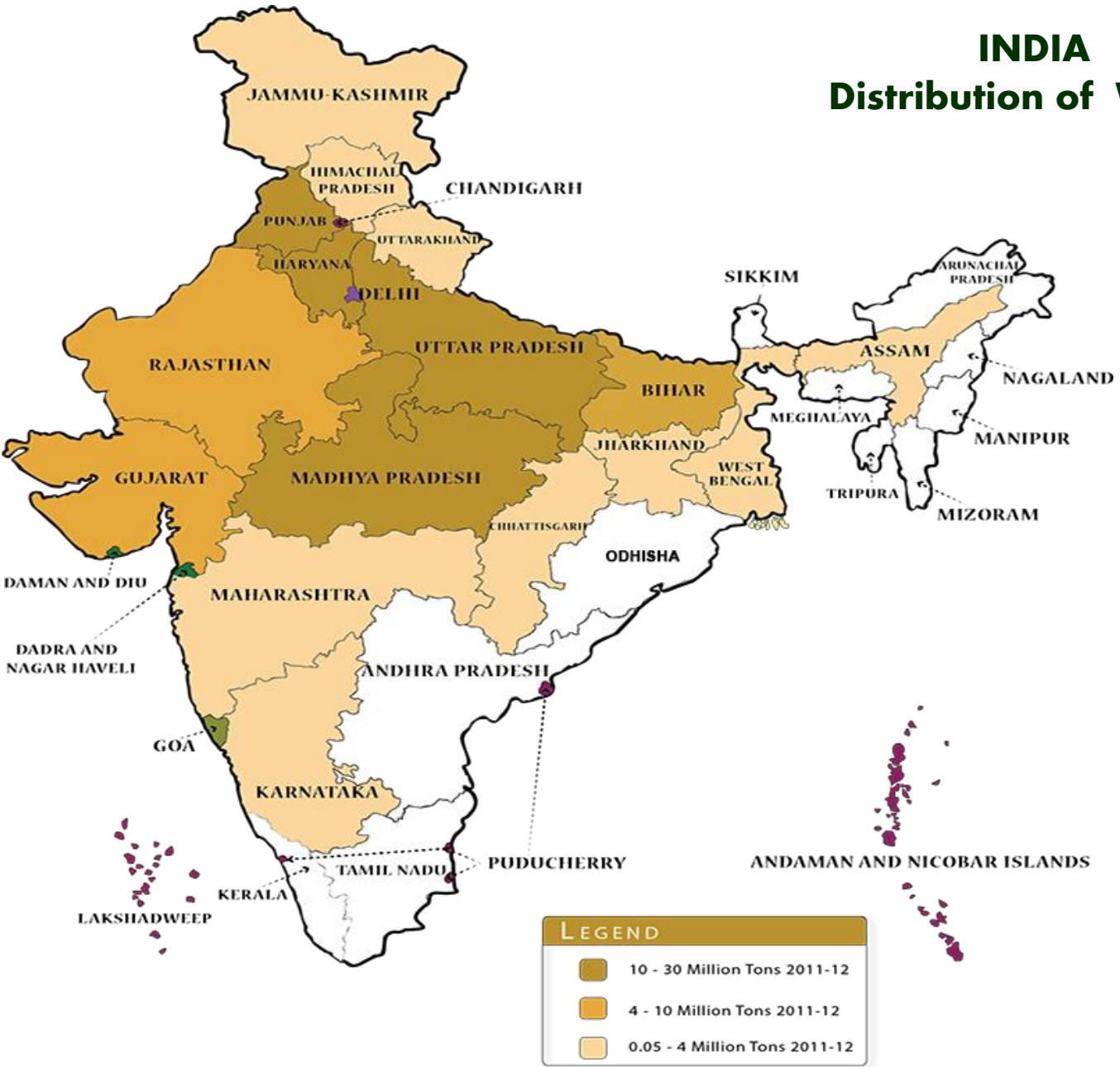
Source: [https://farmer.gov.in/M\\_cropstaticswheat.aspx](https://farmer.gov.in/M_cropstaticswheat.aspx)

Zones	States/Regions Covered	Approx Area(million ha)
Northern Hill Zone(NHZ)	Hilly areas of J&K( except Jammu, Kathua and Samba districts), Himachal Pradesh ( except Una & Paonta valley),Uttarakhand(excluding Tarai region) & Sikkim	0.8
North Western Plains Zone(NWPZ)	Punjab,Haryana,Western UP(except Jhansi Div),Rajasthan (excluding Kota & Udaipur div),Delhi, Tarai region of Uttarakhand, Una & Paonta valley of HP, Jammu,Samba & Kathua districts of J&K and Chandigarh.	11.55
North Eastern Plains Zone(NEPZ)	Eastern UP(28 dist),Bihar,Jharkhand,West Bengal,Assam, Odisha and other NE states (except Sikkim)	10.5
Central Zone	MP,Gujarat,Chattisgarh,Kota & Udaipur Div of Rajasthan & Jhansi Div of UP.	5.2
Peninsular Zone	Maharashtra, Tamil Nadu(except Nilgiris & Palani Hills),Karnataka & Andhra Pradesh	1.6
Southern Hill Zone(SHZ)	Nilgiris & Palani Hills of Tamil Nadu	0.1



# INDIA

## Distribution of Wheat



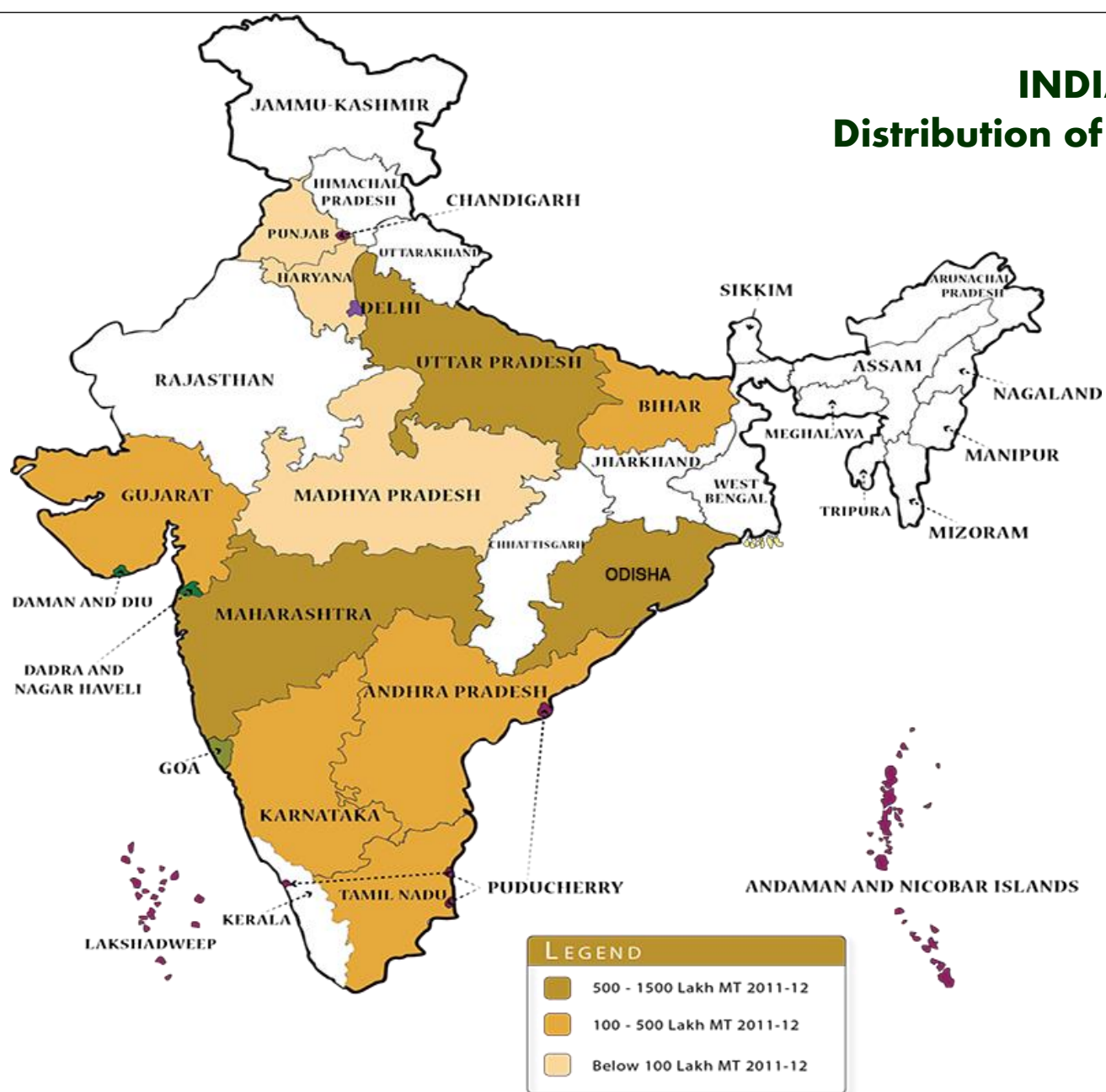
Source: Annexure <http://agricoop.gov.in/sites/default/files/Wheat Profile July 2018.pdf>

## **Sugarcane:**

- India stands first in area (3.93 m. ha) and production (167 m.t) among the sugarcane growing countries of the world.
- Uttar Pradesh has the largest area almost 50 per cent of the cane area in the country, followed by **Maharashtra, Karnataka, Tamil Nadu, Andhra Pradesh, Gujarat, Bihar, Haryana and Punjab.**

# INDIA

## Distribution of Sugarcane



## **Cotton:**

- Cotton is one of the most important fiber and cash crop of India and plays a dominant role in the industrial and agricultural economy of the country.
- Cotton in India provides direct livelihood to 6 million farmers and about 40-50 million people are employed in cotton trade and its processing.

## **Distribution of Cotton:**

- In India, there are ten major cotton growing states which are divided into three zones: **north zone, central zone and south zone.**
- North zone consists of **Punjab, Haryana, and Rajasthan. Central zone includes Madhya Pradesh, Maharashtra and Gujarat.**
- South zone comprises **Andhra Pradesh, Telangana, Karnataka and Tamil Nadu.** Besides these ten states, cotton cultivation has gained momentum in the **Eastern State of Orissa.**
- Cotton is also cultivated in small areas of non-traditional States such as **Uttar Pradesh, West Bengal & Tripura.**

## **Groundnut:**

- **Groundnut** is the major oil seed crop in **India** and it plays a major role in bridging the vegetable oil deficit in the country.
- **Groundnuts in India** are available throughout the year due to a two-crop cycle harvested in March and October.
- India is the **second largest producer of groundnuts** in the world. Indian groundnuts are available in different varieties: Bold or Runner, Java or Spanish and Red Natal. The main Groundnut varieties produced in India are Kadiri-2, Kadiri-3, BG-1, BG-2, Kuber , GAUG-1, GAUG-10, PG-1 , T-28, T-64, Chandra, Chitra, Kaushal, Parkash, Amber etc.

## **Distribution of Groundnut :**

- Apart from raw edible peanuts, India is also in a position to supply Blanched Peanuts, Roasted Salted Peanuts and Dry Roasted Peanuts and a variety of peanut based products.
- **Gujarat, Andhra Pradesh, Tamil Nadu, Karnataka, Maharashtra ,Rajasthan, Madhya Pradesh, Orissa, and Uttar Pradesh.**

# PLANTATION CROPS

## Tea and Coffee:

**Tea:** Tea has approximately 55 milligrams of caffeine per cup. Various **teas** contain different amounts of caffeine. Green **tea** contains the least, about one-third the caffeine as black and oolong about two-thirds as much.

**Coffee:** Coffee has approximately 125-185 milligrams of caffeine per cup.

- South Indian states are the major producer of Coffees in India with **Karnataka 53%, Kerala 28%, Tamil Nadu 11% and remaining from the other states includes Andhra Pradesh, Orissa, Assam and Tripura.**
- Hilly area and good monsoon in this region makes it best place for important varieties of coffee and tea plantation.
- Indian coffee is considers as one of the finest coffee in the world, they grown under the shade rather than direct sunlight.

# AGRICULTURAL REGIONS IN INDIA

- Agricultural region is defined as an area having homogeneity in relief, soil type, climatic conditions, farming practices, crops produced and crop association.

## Agricultural regions

- A. Rice-Jute-Tea Region:
- B. Wheat and Sugarcane Region:
- C. Cotton Region:
- D. Maize and Coarse Crops Region:
- E. Millets and Oilseeds Region and
- F. Fruits and Vegetable Region.

## **A.Rice-Jute-Tea Region:**

- This vast region includes lowlands, valleys and river deltas in the states of Assam, Arunachal Pradesh, Tripura, Meghalaya, West Bengal, Orissa, northern and eastern Bihar parts of Jharkhand and Chhattisgarh and Tarai region of Uttar Pradesh.
- The rainfall varies from 180 to 250 cm. Rice are the predominant crop due to fertile alluvial soils, abundant rainfall and high summer temperatures. Jute is mainly grown in the Hugli basin of West Bengal but some areas have been brought under jute cultivation in Assam, Meghalaya, Tripura, Orissa and Tarai region of U.P.
- Tea is mainly grown in Assam, Darjeeling and Jalpaiguri areas of West Bengal and Tripura. Sugarcane and tobacco are grown in Bihar. Coconut is grown in coastal areas. Mango, pineapple, betel leaves, bananas, jack fruits, and oranges are the main fruit crops.



## **B. Wheat and Sugarcane Region:**

- This region comprises Bihar, Uttar Pradesh, Punjab, Haryana, Western Madhya Pradesh and north eastern Rajasthan. Most of the areas have rich fertile alluvial soils with some parts having black and red soils. Rainfall is moderate, large part of which is caused by south-west monsoons in summer. Some rainfall is caused by western disturbances in winter.
- Irrigation is a vital input in drier areas. As its name indicates, this region is dominated by wheat and sugarcane cultivation. The main wheat belt of India extends over Punjab, Haryana, Ganga-Yamuna doab of Uttar Pradesh and north-eastern Rajasthan. Sugercane is mainly grown in Uttar Pradesh and contiguous parts of Bihar. Rice, pulses and maize are the other important crops.

### **C. Cotton Region:**

- It spreads on the regur or black cotton soil area of the Deccan plateau, where the rainfall varies from 75 to 100 cm. Obviously, cotton is the main crop but jowar, bajra, gram, sugarcane, wheat, etc. are also grown.

### **D. Maize and Coarse Crops Region:**

- Western Rajasthan and northern Gujarat are included in this region. The rainfall is scanty and is normally below 50 cm. Agriculture is possible only with the help of irrigation. Maize is mainly grown in the Mewar plateau where wheat and ragi are also produced. In the southern part, rice, cotton and sugarcane are grown. Bajra and pulses are grown throughout the region.

## **E. Millets and Oilseeds Region:**

- This region includes areas of poor soils and broken topography in Karnataka plateau, parts of Tamil Nadu, southern Andhra Pradesh and eastern Kerala. The rainfall varies from 75 to 125 cm. The millets include bajra, ragi and jowar while the oilseeds grown are groundnut and castor. Pulses are also grown. Mangoes and bananas are important fruit crops.

## **F. Fruits and Vegetable Region:**

- This region extends from Kashmir Valley in the west to Assam in the east. The rainfall varies from 60 cm in the west to 200 cm in the east. Apple, peach, cherries, plum, apricot are grown in the west while oranges are important in the east. Besides, rice, maize, ragi potatoes, chillies and vegetables are also grown.

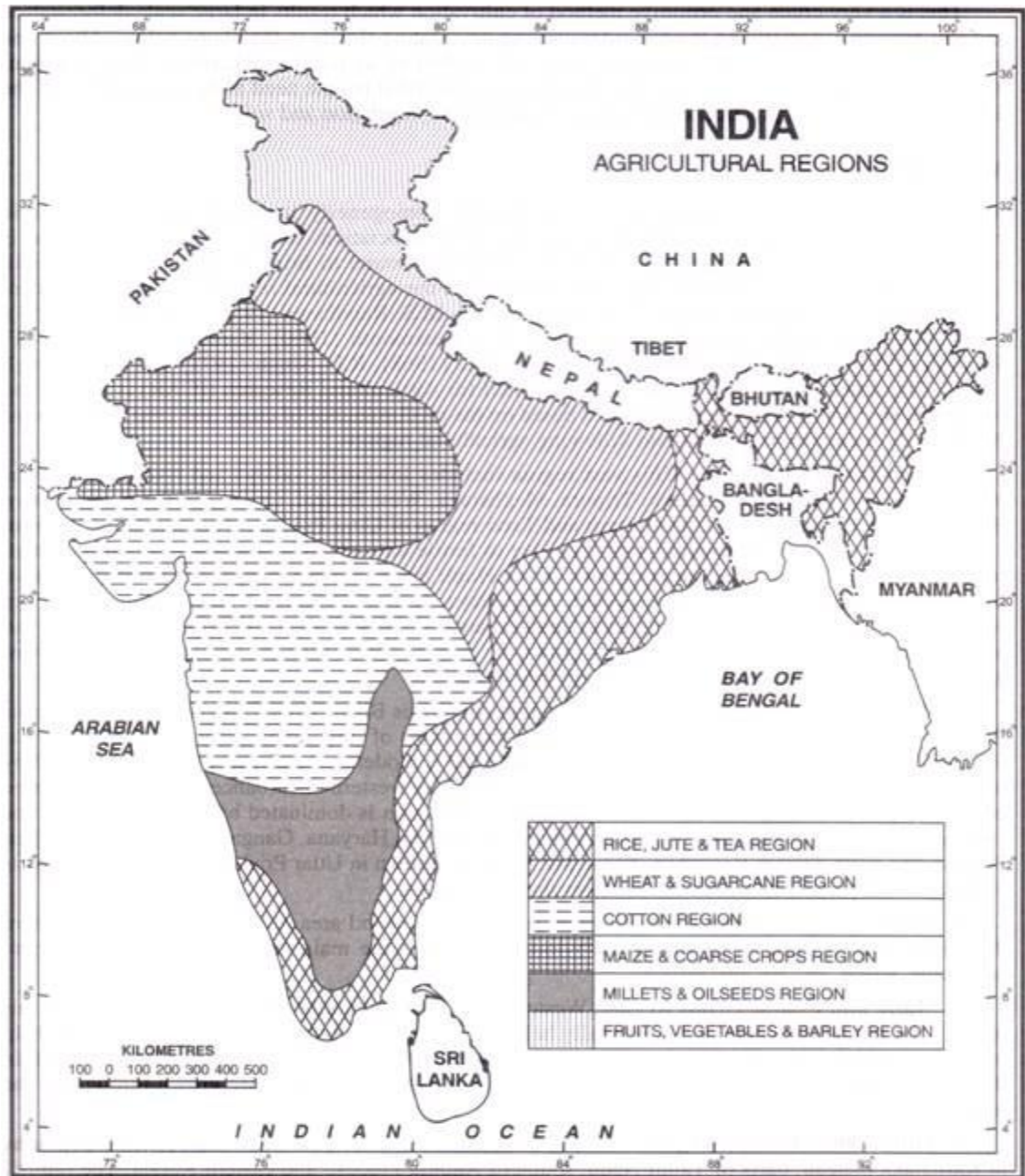


FIG. 22.1. India : Agricultural Regions

# GREEN REVOLUTION

## **Definition:**

- **J. G. Harrar** - “The green revolution is the phrase generally used to describe the spectacular increase that took place during 1967-68 and is continuing in the production of food grains in India”.

## **Methods Used in Green Revolution:**

- Double/ Multiple Cropping system,
- Seeds with superior genetics,
- Proper irrigation system,
- High Yielding Variety (HYV) of seeds,
- Use of pesticides and fertilizers,
- Use of modern machinery (Tractor, Harvester, Thrasher)
- Expansion of farming areas.

## **Basic Elements in Green Revolution:**

- Continued expansion of farming areas: **Green Revolution** continued with quantitative expansion of farmlands.
- Double-cropping existing farmland: Instead of one crop season per year, the decision was made to have two crop seasons per year. There had to be two “monsoons” per year. **One would be the “natural monsoon and the other an artificial monsoon”.**
- Using seeds with superior genetics: This was the scientific aspect of the Green Revolution to use High Yielding Variety (HVY) of seeds.

## **Causes of Green Revolution:**

High Yielding Varieties of Seed, Chemical Fertilizers, Irrigation, Multiple Cropping, Modern Agricultural Machinery, Credit Facilities, Agricultural Research, Plant Protection, Rural Electrification, Soil Testing and Soil Conservation.

## **Effects of Green Revolution:**

Increase in Production, Capitalistic Farming, Effect on Rural Employment, Reduction in Imports of food grains, Development of Industries, Effect on Prices, Base for Economic Growth, Effect on consumers, Effect on Planning, Increase in Trade, Change in Thinking of Farmers.

As a technological innovation, the Green Revolution replaced **“One way of life in another in short span of two decades”**. The lesson learned from this green revolution should enable policy makers to reduce the adverse effects of the coming Biorevolution based on genetic engineering.

# Agricultural Problems

- About 57% of the land is covered by crop cultivation in India.
- However, in the world, the corresponding share is only about 12%.
- On the other hand, The land - human ratio in the country is only 0.31 ha, which is almost half of that of the world as a whole - 0.59 ha.

## **Major problems of the Indian agriculture system are**

- Dependence on erratic monsoon,
- Low productivity,
- Constraints of financial resources and indebtedness,
- Lack of proper land reforms,
- Small farm size and fragmentation of landholdings,
- Lack of commercialization, under-employment, and
- Degradation of cultivable land.



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