GEOGRAPHY – MODULE 3.2

Indian Agriculture – Cropping Pattern – Irrigation – Food Security – Green Revolution

INDIAN AGRICULTURE

- Agriculture is the made up of two words – Latin words – 'Ager' : Land and 'Culture' : cultivation.
- Second largest producer of wheat and rice.
- Important sector of Indian economy.
- Contributes 17% of Indian GDP.
- Provides employment for about 60% to 70% of the total population.
- The practice of cultivating the livestock.
- The backbone of Indian economy.
- 46% - total cultivated area in India.
- Provides raw material for – textiles, sugar, flour mills, jute, etc.
- Allied sectors in agriculture - horticulture, animal husbandry, dairy farming, fishing.

Features:

Subsistence agriculture	Mostly found. Used for Self-consumption. No surplus production. Small scattered land holdings. Use of primitive tools. Do not use fertilizers and high yielding variety of seeds.
Commercial agriculture	Large scale commercial agriculture is practiced. Tea plantation in Assam, Coffee in Karnataka, Coconut in Kerala. Surplus sold in markets.

Mechanization	After green revolution – increase in the use of machines in farms. Punjab, Haryana, Western Uttar Pradesh, Andhra, Tamil Nadu.
Monsson dependent	Depends on monsoon rains. Lack of irrigation facilities.
Variety of crops	Different types of topography, soils, climates – results in the production of variety of crops. Example – Hilly areas suitable for tea cultivation. Plains for rice cultivation.
Predominance of food crops	Food crops are given priority for agriculture – in order to feed huge Indian population. Ensuring food security in the nation.

Three crop seasonal patterns:

- These three types of cropping seasonal pattern do not exist in Southern part of India due to high temperature.
- There same crop can be grown thrice a year.

Kharif Season	Require good amount of water. Depends on Southwest Monsoon
Rabi Season	Winter in October – November. Harvest in March – April. Celebration of Holi festival is related to the month of March and April.
Zaid Season	Short summer cropping season. Begin after harvesting rabi crops. Cultivation of – watermelons, cucumbers, vegetables, fodder crops.

Shifting Cultivation or Land Rotation or Jhum	Shifting of land after the cultivation of a crop when the soil loses its fertility. Forest land is cleared and cultivated. Same crop – rice – can be cultivated at different areas of land. After the harvest – the land and remains of crops are slashed and burnt. Leads to soil erosion due to clearing of forest. Practiced in Norther states of India – Jharkhand, Madhya Pradesh, Himalayas, Western Ghats, Eastern Ghats. Various names – Jhum in Assam, Ponam in Kerala, Podu in Andhra Pradesh and Odisha, Bewar Masha Penda and Bera in Madhya Pradesh.
Crop Rotation	Reverse of land rotation. Planting different crops on the same plot of the land to improve soil health, nutrients in the soil, combat pest, weed pressure. Conserves moisture.
Zero Tillers Farming or No-Till Farming	Tillage – agricultural land preparation through mechanical agitation – digging, stirring, overturning. Zero Tillage – process where the crop seeds will be sown through drillers without prior land preparation and disturbing the soil where previous crop stubbles are present. Reduces the cost of cultivation. Widely used in United States.
Dryland, Wetland Farming	Dry land – ▪ practiced in low rai fall regions. ▪ Rajasthan, Gujarat, Maharashtra. ▪ Low retention capacity. ▪ Helps in soil and water conservation. ▪ Crops – peas, millets, grams, etc. Wetland – ▪ Practiced in high annual rainfall receiving regions. ▪ River plains, north east India, Ghats, etc. ▪ Require high irrigation. ▪ Types- rice, sugarcane, cotton, jute.

Zero Budget Natural Farming ZBNF	Elimination of chemical pesticides, sustaining agriculture, Promotes ecofriendly process, restoring soil fertilizers. Unique chemical free methods. Involves agroecology. Zero net expenditure of manufacturing, yielding – zero budget. Ensure that farming particularly small holder farming. Enhance biodiversity and ecosystem services. cow dung – increase fertility and nutrient value of soil. Four wheels – **Jiwamrita** (Fermented mixture of cow dung and urine, jaggery, pulse flour, water, soil from farm bund), **Bijamrita** (mix of cow dung and urine, bund soil, water, lime as seed treatment), **Mulching** (covering the plant with a layer of dried straw or fallen leaves to conserve moisture), **Waaphasa** (water to maintain the required water moisture air balance) – Palekar, A Padma Sree awardee.
Terrace Cultivation	Hilly and mountain slopes. Same as permanent agriculture. Provide small patch of level land. Soil erosion is also checked.

PLANTATION AGRICULTURE

- Commercial farming.
- Single crop is grown in the entire year.
- Major crops – tea, coffee, sugarcane, cashew, rubber, banana, cotton.
- Found in tropical regions.
- Export oriented agriculture.

Agricultural Production:

Position of India – largest producer of milk, millets, jute, ginger, banana, castor oil seeds, mangroves, sunflower oil seeds, papayas.

Rice – Jute – Tea Region	Includes lowlands, valleys, river deltas of assam, Arunachal Pradesh, Tripura, Meghalaya, west Bengal, Orissa, Bihar, Jharkhand, Chhattisgarh, Uttar Pradesh 180-250cm rainfall Rice-alluvial soil Jute-Hugli basin of west Bengal Tea-assam, Bengal, Tripura Sugarcane and tobacco-Bihar Coconut-coastal areas Main fruit crop-mango, pineapple, betel leaves, banana, jackfruit.
Wheat – Sugarcane Region	Irrigation is a vital input in drier areas. Bihar, Uttar Pradesh, Punjab, Haryana, western Madhya Pradesh, north eastern Rajasthan Rich fertile alluvial soil, black and red soil. Moderate rainfall-south west monsoon in summer Dominated by wheat and sugar cultivation Wheatbelt-Punjab, Haryana, ganga, Yamuna, doab of Uttar Pradesh, north eastern Rajasthan. Sugarcane- Uttar Pradesh, Bihar. Rice, pulses, maize.
Cotton Region	Deccan plateau- black cotton soil. 75-100cm. Jowar, bhajra, gram, sugarcane, wheat
Maize and coarse crops region	Western and northern Gujarat. Rainfall- scanty and normal below 50cm. Help of irrigation. Maize, wheat, ragi- Mewar plateau. Rice, cotton, sugarcane-southern part. Bhajra and pulses

Millet and oil seeds region	Pure soils and broken topography in Karnataka plateau in Tamilnadu, southern Andhra Pradesh, eastern Kerala. Rainfall- 75 to 125cm. Millets include bhajra, ragi, jowar. Oil seeds- groundnut castor. Pulses, mango, banana
Fruits and vegetable region	Kashmir valley in the west to assam in the east. Rainfall- 60cm in the west to 200cm in the east. West- apple, peach, cherries, plum, apricot. East – orange. Rice, maize, ragi, potatoes, chilies, vegetables.

CROPPING PATTERN

- Not static.
- Varies with time and space.
- No major change in cropping pattern in India during first three 5-year plan – 1951 to 1966.
- Food crops gained importance with advent of green revolution.

Factors affecting cropping pattern:

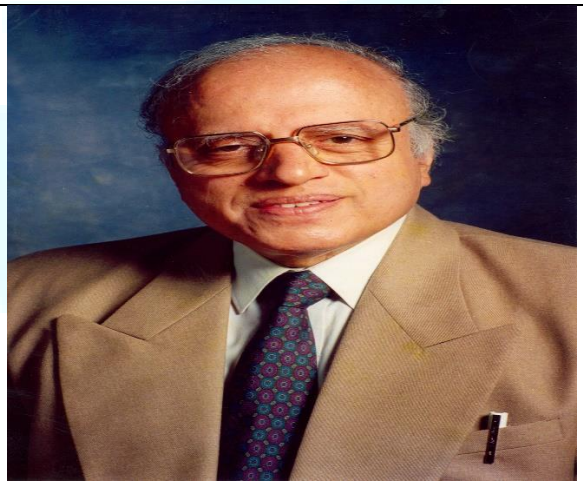
Geographical factors	Economic factors	Political factors
Relief Soil Temperature Rainfall	Irrigation Size of land holding Scale prize of crops and income of farmers. Insurance and investment	

GREEN REVOLUTION

- William Gadd – 1968 – used the term – Green Revolution – first time.

- Multiple growth in crop production in third world countries- use of modern input, technologies, farm mechanization, irrigation facilities, HYV.
- 1961- M.S. Swaminathan- invited Borlaug – suggested revolution in Indian agriculture.
- 1965- 66 HYV program was started.

Phases	
Phase 1 1965 to 1980	Crops specification and region specification. Punjab, Haryana, western Uttar Pradesh. Started with IADP and IAAP program
Phase 2 1980 to 1991	Partial success. Krishna Godavari delta, Kaveri basin – high production
Phase 3 1991 to 2003	Dry land agriculture – target. Introduced – cotton oil seeds, pulses. Integrated water shed management program was initiated. Rainbow revolution. 11th plan- idea was elevated to sustainable with balanced growth referred to an inclusive growth.



MULTI PURPOSE PROJECTS IN INDIA

MULTI PURPOSE PROJECTS	RIVER	STATE
Bansagar project	Son	Bihar, UP, MP
Bargi project	Bargi	MP

Beas project	Beas	Haryana, Punjab, Rajasthan
Damodar Ghati project	Damodar	Jharkhand, West Bengal
Dulhasti project	Chenab	Jammu and Kashmir
Durga Barrage project	Damodar	Jharkhand, West Bengal
Farakka project	Ganga, Bhageerathi	West Bengal
Gandak project	Gandaki	Bihar, UP
Ganga sagar project	Chambal	MP
Ghataprabha project	Ghataprabha	Karnataka
Girna project	Girna	Maharashtra
Hansdev project	Hansdev	MP
Hidkal project	Ghataprabha	Karnataka
Hirakud project	Mahanadi	Orissa
Idukki project	Periyar	Kerala
Indhira Gandhi Canal project	Sutlej	Rajasthan, Punjab, Haryana
Jawahar Sagar project	Chambal	Rajasthan
Jaya wadi project	Godavari	Maharashtra
Kakrapara project	Tapti	Gujarat
Kunda project	Kunda	TN
Madhya ganga canal project	Ganga	UP
Mahanadi delta project	Mahanadi	UP
Let bank Ghagra project	Ganga	Odisha
Tungabadra project	Tungabadra	Andhra Pradesh, Karnataka
Ukai project	Tapti	Gujarat
Uri project	Jhelum	Jammu and Kashmir
Umium project	Umium	Shillong
Vyas project	Vyas	Gujarat, Rajasthan, Punjab, Haryana, Himachal Pradesh

Sarada Sarowar project	Narmada	Madhya Pradesh, Maharashtra, Rajasthan
Sarhind project	Sutlej	Haryana
Sharawati project	Sharawati	Karnataka
Satlej project	Chenab	JK
Tehri Dam project	Bhagirathi	Uttarakhand