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Agriculture in India

The word agriculture is derived from Latin words ager or **Agri meaning soil** and **culture meaning cultivation**.

Farming types 1. Subsistence farming

2. Commercial farming.

Primitive subsistence agriculture includes

- **Shifting cultivation**

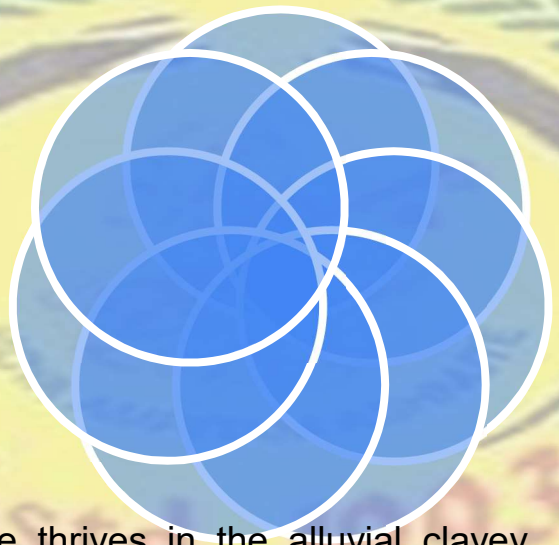
and

- **Nomadic herding**

Natural Factors

Tea plantations in the hill slopes of Darjeeling benefit from well-drained soils and the region's cool, moist climate, which are ideal for tea cultivation.

Topography



Climate

Example: Wheat production in Punjab, India, relies on the region's cool winters and dry spring weather, which are ideal for the crop's growth and maturation phases.

Rice thrives in the alluvial clayey soils of the Ganges Delta in West Bengal, which retain water well and provide the necessary nutrients.

Soil

2. Human Factors

1. Labor

Example: The labor-intensive process of transplanting rice seedlings is efficiently managed in the rice paddies of Vietnam, ensuring good crop establishment.

2. Technology

Example: The adoption of combine harvesters in wheat fields of the USA allows for efficient and quick harvesting, reducing labor costs and post-harvest losses.

3. Farming Practices

Example: Crop rotation practices in the Midwestern United States, such as alternating between corn and soybeans, help maintain soil fertility and reduce pest cycles.

4. Knowledge and Education

Example: Agricultural extension programs in Kenya educate farmers on drought-resistant maize varieties and modern farming techniques, improving yields in arid regions.

Economic Factors

1. **Capital.** **Example:** Access to ***microfinance in Bangladesh*** enables small-scale farmers to buy quality seeds and fertilizers, boosting their productivity and income.
2. **Market Access Example:** Proximity to urban markets in the Netherlands allows greenhouse tomato producers to quickly transport and sell fresh produce, ensuring better prices and reduced spoilage.
3. **Government Policies Example:** The Indian government's ***Minimum Support Price (MSP) for wheat*** ensures that farmers have a guaranteed price, encouraging them to maintain or increase production levels.
4. **Input Availability**
5. **Example:** The availability of high-yielding ***hybrid maize seeds in Mexico*** has led to significant increases in maize production and farmer incomes.
6. **Infrastructure cold storage facilities**

Example: The development of in Himachal Pradesh, India, helps ***apple growers store*** their produce longer, reducing post-harvest losses and stabilizing market prices.

Biological Factors

1. Crop Variety

Example: The cultivation of **Bt cotton in India**, which is genetically modified to resist bollworm, has led to higher yields and reduced pesticide use.

2. Pests and Diseases

Example: Integrated pest management (IPM) in California's vineyards uses natural predators and minimal chemical treatments to manage pests, leading to healthier vines and better grape yields.

Social Factors

1. Cultural Practices

Example:

The traditional practice of terrace farming in the Philippines' Banaue Rice Terraces helps conserve soil and water, enabling rice cultivation on steep slopes.

2. Land Tenure System

Example:

Secure land tenure in Ethiopia encourages farmers to invest in their land, leading to improved soil management and higher crop yields.

Environmental Sustainability

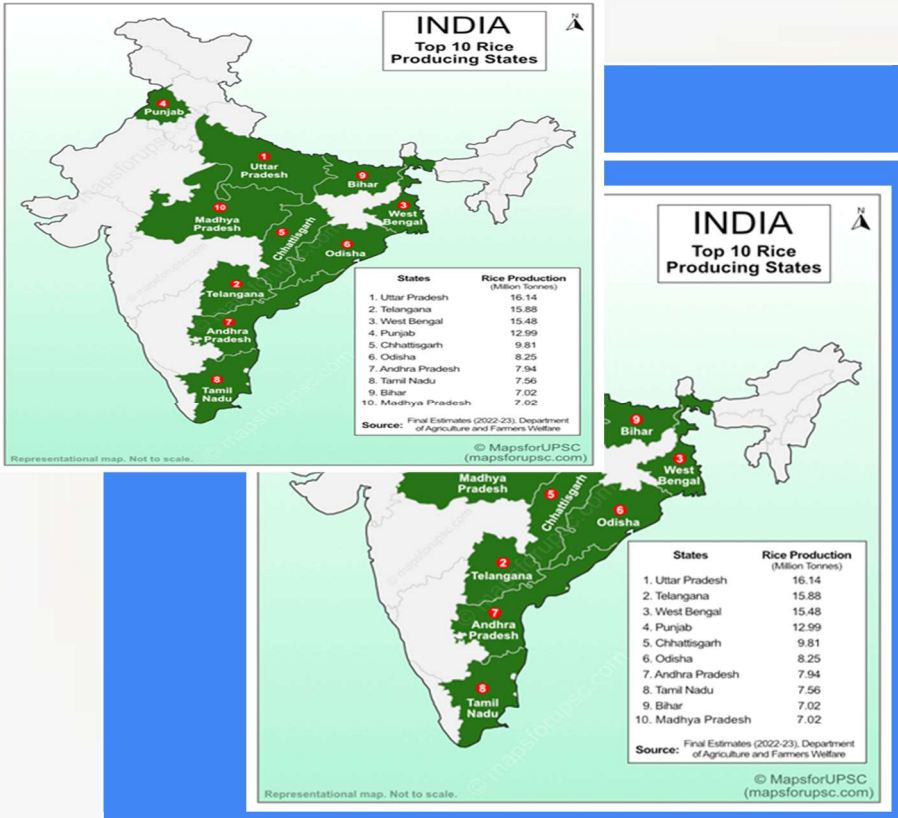
1. Sustainable Practices
Example:

Organic farming practices in Denmark, such as crop rotation, composting, and biological pest control, promote long-term soil health and sustainable crop production.

India has three cropping seasons — **Rabi, Kharif and Zaid.**

Aspect	Kharif Season	Rabi Season	Zaid Season
Time Period	June to September	October to March	March to June
Climate	Monsoon season with high rainfall and humidity	Post-monsoon season with moderate temperature and low rainfall	Transition period with moderate to high temperature
Soil Requirements	Varies; typically fertile, well-drained soils that can retain moisture	Well-drained loamy and clayey soils	Fertile soils with good water retention
Harvesting Time	September to October	March to April	June to July
Economic Importance	Major food and cash crops contributing to both food security and industry (textile, sugar)	Key food crops for domestic consumption and export	Provides supplementary income and food between major seasons

Aspect	Kharif Season	Rabi Season	Zaid Season
Major Crops	Rice, maize, cotton, sugarcane	Wheat, barley, mustard	Watermelon, cucumber, vegetables



Top 3 Rice Producing States in India:

1. **Uttar Pradesh**
2. **Telangana**
3. **West Bengal**

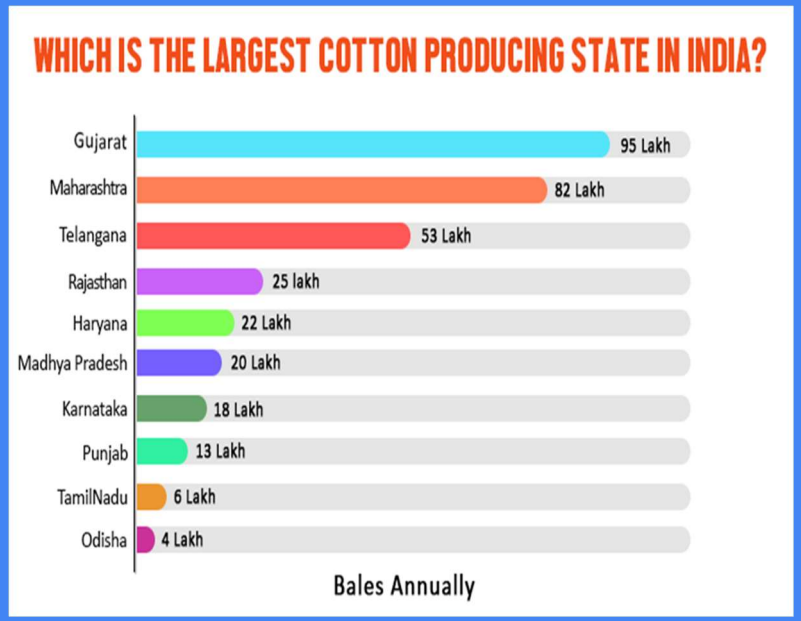
Reasons for Being a Kharif Crop

1. Water Requirement: Rice requires a substantial amount of water, which is abundantly available during the monsoon season.
1. Climate: Needs high temperature (25-35°C) and high humidity, conditions typically met during the Kharif season in India.
1. Soil: Thrives in alluvial clayey soil that can retain water, which is replenished by the monsoon rains.
1. Sowing Time: Sown at the beginning of the monsoon season (June) to take advantage of the natural water supply.

- India is the second

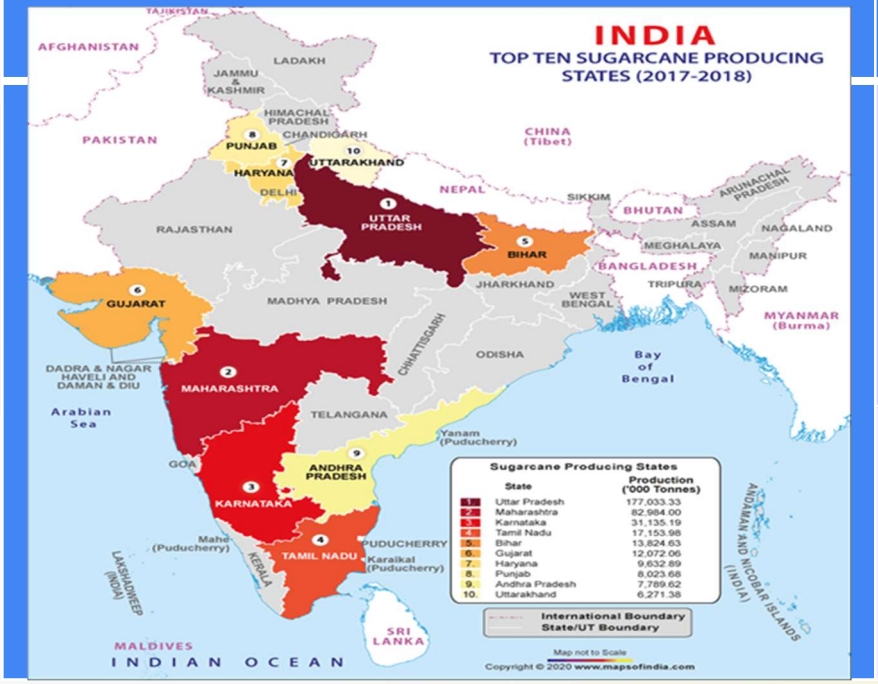
largest producer of rice in the world after China

Maize	Water Requirement: Maize needs moderate rainfall, which is provided by the monsoon. 400-550 mm
	Climate: Requires warm temperatures (20-30°C) and a lot of sunshine, both of which are available during the Kharif season.
	Soil: Grows well in well-drained fertile soils, old alluvial soil
	Sowing Time: Sown with the onset of the monsoon season for germination and growth.
Major maize-producing states are: **In 2024, India's top maize-producing states are Karnataka, Madhya Pradesh, and Maharashtra**	In some states like Bihar maize is grown in rabi season also

Cotton	Water Requirement: Cotton requires light to moderate rainfall, making it suitable for the monsoon season.
	Climate: Needs high temperatures (25-35°C) and a long frost-free period 210 frost-free days, conditions met during the Kharif season.
	Soil: Prefers black soil and alluvial soil, which retain moisture well, especially after monsoon rains.
	Sowing Time: Planted at the beginning of the monsoon to ensure water availability during the crucial growth stages.
	Cotton requires 6 to 8 months to mature.

Sugarcane

(Food Crops other than Grains)



- Water Requirement: Requires a significant amount of water throughout its growing period. an annual rainfall between 75cm and 100cm

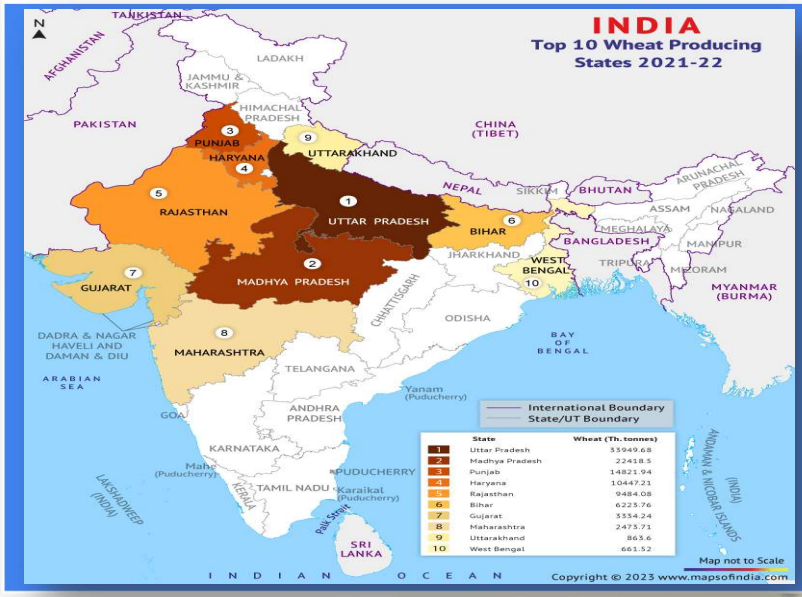
- Climate: Thrives in hot and humid conditions (20-40°C), typical of the Kharif season.

- Soil: Grows best in well-drained, fertile soils that are kept moist by monsoon rains.

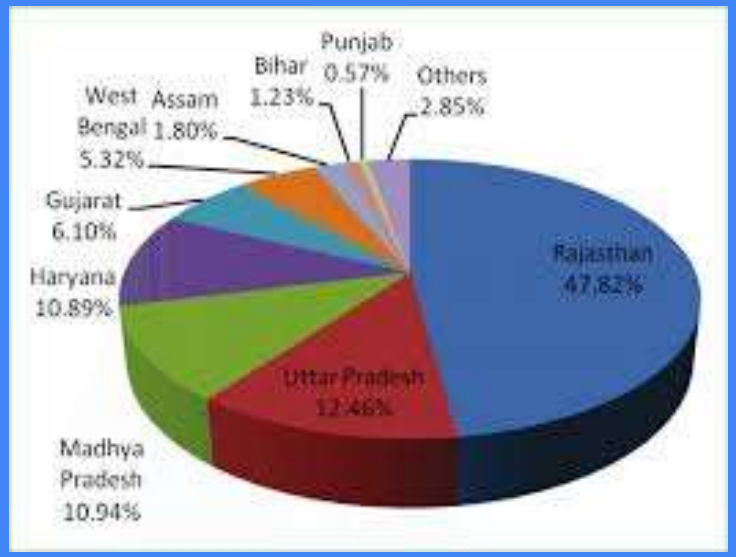
Some other Kharif crop

Aspect	Bajra (Pearl Millet)	Jowar (Sorghum)	Pulses
Water Requirement	Moderate rainfall	Moderate to low rainfall	Moderate rainfall
Climate	(25-35°C), withstands dry conditions	Warm temperatures (25-35°C), drought-resistant	Warm temperatures (20-30°C), tolerates some drought
Soil	Less fertile, sandy, well-drained soils	Well-drained sandy and loamy soils	Well-drained loamy soils
Sowing Time	Onset of monsoon (June-July)	Onset of monsoon (June-July)	Onset of monsoon (June-July)
Harvesting Time	End of monsoon (September-October)	End of monsoon (September-October)	End of monsoon (September-October)
Major Producers	India, Niger, Nigeria	India, USA, Nigeria, Mexico	India, Myanmar, Canada, China
Uses	Food, fodder, industrial uses (alcohol, biofuel)	Food, fodder, industrial uses (syrup, alcohol)	Food (dal, sprouts), soil fertility improvement

Rabi crops

Wheat	Climate: Requires moderate temperatures (10-25°C) and low humidity, conditions typical of the winter season in India.
	Rainfall: Needs moderate rainfall during the growing season and dry conditions at the time of harvest. 50 to 75 cm of annual rainfall
	Soil: Thrives in well-drained loamy soil, which retains moisture from the post-monsoon period.
	Sowing Time: Sown after the monsoon rains have receded (October-November) to utilize the residual soil moisture.
	Harvesting Time: Harvested in late spring (March-April) when the weather is dry, preventing grain spoilage

Mustard



Climate:

Needs cool temperatures (10-25°C) during the growing season and is sensitive to frost, making the winter season ideal.

Rainfall:

Requires moderate rainfall for germination and growth but dry conditions during the later stages of development and harvest. (25 to 40 cm of rainfall)

Soil:

Prefers well-drained loamy or sandy loam soils with good fertility and moisture retention.

Sowing Time:

Sown after the monsoon (October-November) to utilize the residual moisture and cooler temperatures.

Oilseed crop

Oil Seed	Cropping Season	Primary Uses	Leading Producing States (2011-12)
Groundnut	Kharif	Edible oil, cooking medium, raw material for soap and cosmetics	Gujarat, Andhra Pradesh, Tamil Nadu
Sesamum (Til)	Kharif (North India), Rabi (South India)	Edible oil, cooking medium, raw material for soap and cosmetics	West Bengal, Uttar Pradesh, Rajasthan
Sunflower	Kharif	Edible oil, cooking medium, raw material for cosmetics	Karnataka, Andhra Pradesh, Maharashtra
Soyabean	Kharif	Edible oil, cooking medium, raw material for cosmetics and food products	Madhya Pradesh, Maharashtra, Rajasthan

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Plantation crop

Aspect	Tea	Coffee	Rubber
Type of Agriculture	Plantation Agriculture	Plantation Agriculture	Plantation Agriculture
Climate	Tropical and sub-tropical, warm and moist frost-free	Equatorial, grown under tropical and sub-tropical conditions	Equatorial, moist and humid with rainfall >200 cm, temperature >25°C (high rainfall)
Soil	Deep, fertile, well-drained, rich in humus and organic matter	Well-drained, rich in organic matter	Well-drained, rich in humus and organic matter
Major Producing States	Assam, West Bengal (Darjeeling and Jalpaiguri hills), Tamil Nadu, Kerala	Karnataka, Kerala, Tamil Nadu	Kerala, Tamil Nadu, Karnataka, Andaman and Nicobar Islands, Garo hills of Meghalaya
Historical Context	Introduced by the British, now mostly Indian-owned	Arabica variety brought from Yemen, initially cultivated in Baba Budan Hills	Industrial raw material, significant in the rubber industry

Fiber crops

Aspect	Cotton	Jute	Hemp	Natural Silk
Source	Crop grown in soil	Crop grown in soil	Crop grown in soil	Cocoons of silkworms fed on mulberry leaves
Soil Requirements	Black and alluvial soils	Well-drained fertile soils, renewed annually	Loamy soils, well-drained	Mulberry leaves as feed for silkworms
Leading Producing States	Maharashtra, Gujarat, Andhra Pradesh	West Bengal, Bihar, Assam, Odisha, Meghalaya	Uttar Pradesh, Punjab, Bihar	Karnataka, West Bengal, Assam, Tamil Nadu
Major Uses	Textile industry, clothing, threads, fabric	Gunny bags, mats, ropes, yarn, carpets, artefacts	Ropes, sacks, fabrics, industrial uses	Silk fabrics, clothing, accessories
Historical Context	Traditionally grown, significant export crop	Known as the "golden fibre"	Traditional use for ropes and fabrics, declining due to synthetics	Historical practice of sericulture
Market Challenges	Competition from synthetic fibres	High cost, losing market to synthetic fibres like nylon	Competition from synthetic fibres, changing regulations	Labour-intensive, requires specific climate and feed

Technological and Institutional Reforms

Period	Reform	Description
First Five-Year Plan (1951-1956)	Land Reform	Focus on land reform, including the consolidation of fragmented land holdings due to inheritance rights.
1960s-1970s	Green Revolution	Introduction of package technology to boost agricultural production, leading to increased yields, but also resulting in regional development disparities.
	White Revolution (Operation Flood)	Focused on increasing milk production through improved dairy farming techniques and cooperative structures.
1980s-1990s	Comprehensive Land Development Programme	Combined institutional and technical reforms, including provision for crop insurance against natural calamities and diseases.
	Establishment of Grameen Banks and Cooperative Societies	Provided farmers with access to low-interest loans, aiding in financial stability and investment in agriculture.
Recent Schemes	Kissan Credit Card (KCC)	Introduced to provide timely credit to farmers for their cultivation and other needs.

Impact of Globalization on Indian Agriculture

Increased Export Opportunities

- Boost in the export of agricultural products like spices, tea, coffee, and rice.
- Entry into global markets has provided farmers with better income opportunities.

Adoption of Advanced Technology

- **Introduction of modern farming techniques and equipment.**
- **Enhanced productivity and efficiency in agricultural practices**.

Diversification of Crops

- **Shift towards high-value crops like fruits, vegetables, and flowers.**
- **Farmers are growing cash crops for better profitability.**

Investment in Agribusiness
Increased foreign direct investment (FDI) in the agricultural sector.
Growth of agro-based industries and rural employment opportunities.
Improved Quality Standards
Adherence to international quality standards and practices.
Better quality produce for both domestic and international markets.
Challenges
Increased competition from global markets can affect local farmers.
Dependence on global market trends leading to price volatility.
Risk of small farmers being marginalized due to lack of resources.

Thank you