



"Good
Farming
Brighter
Tomorrow"

Introduction to Agricultural Practices

Handwritten Notes

Soil
Plants
People
A Sustainable
Future ❤️

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"Healthy Soil
Healthy Crops
Healthy Life"



Agriculture today
for a better tomorrow ❤️



Grow
Learn
Conserve

Chapter 1

Introduction to Agricultural Practices

Agriculture is not just a way of growing food, but a way of life that sustains people, economy and the environment.

1.1 Introduction

- Agriculture is the practice of growing crops, rearing animals and managing natural resources for human use.
- It provides food, raw materials and employment.
- Agricultural practices include all the activities from land preparation to harvesting, storage and marketing.

Importance of Agricultural Practices

- Ensures food security and nutrition.
- Provides livelihood to a large population.
- Supplies raw materials for industries.
- Supports national economy and rural development.
- Helps in conservation of natural resources.
- Promotes balanced regional development.

"Healthy Agriculture → Healthy People
Healthy Planet"

Agriculture in India

- India is one of the largest agricultural countries in the world.
- A large part of the population depends on agriculture for their livelihood.
- It contributes significantly to the country's GDP.
- Agriculture provides employment to almost half of the total workforce.
- India produces a wide variety of crops due to different climatic conditions.
- There are immense opportunities in agriculture through modern technology, value addition and export.

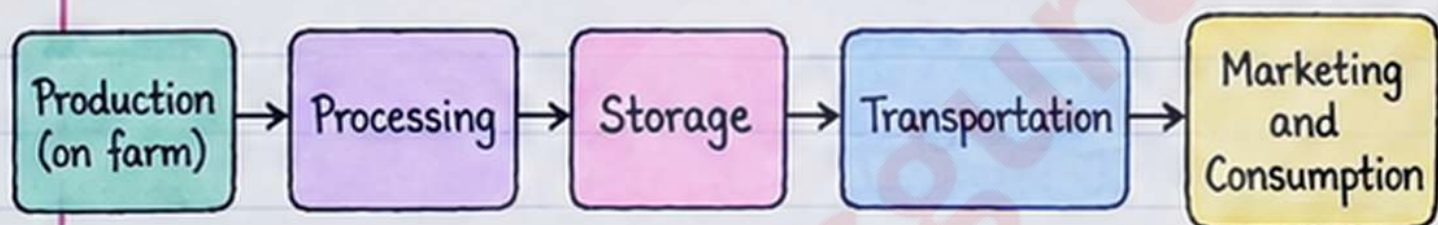
Agriculture is the backbone of the Indian economy.

Traditional Agricultural Knowledge

- India has a rich tradition of agricultural knowledge.
- Ancient texts like **Krishi-parāshara** provide detailed information on farming practices, seasonal activities, crop management and weather prediction.
- This knowledge was based on observation, experience and close association with nature.
- Many traditional practices are still relevant today and can be combined with modern scientific methods.

Value Chain in Agriculture

- A value chain includes all the activities that add value to agricultural produce from the stage of production to the final consumer.
- Each stage in the chain increases the value of the product.



Stages of Agricultural Value Chain

1. Production - growing crops and rearing animals.
2. Post-harvest handling - cleaning, grading and sorting.
3. Processing - converting into usable products.
4. Storage - keeping the produce safe for future use.
5. Transportation - moving products to markets.
6. Marketing - selling to consumers.
7. Consumption - final use by consumers.

Costs involved in the Value Chain

- Each stage involves certain costs such as:
 - Cost of inputs (seeds, fertilisers, labour, etc.)
 - Storage costs
 - Processing costs
 - Transportation costs
 - Marketing and distribution costs
 - Profit at different levels.
- Efficient management of these costs helps in increasing the value and profitability of agricultural produce.

Agro-climatic Relationship.

- Agriculture is closely linked with climate.
- Climate influences the type of crops grown, cropping pattern, yield and farming practices.
- Different regions have different agro-climatic conditions such as temperature, rainfall, humidity and soil type.
- Farmers choose crops and practices that are suitable for their local climate.

Understanding the agro-climatic relationship helps in better planning and higher productivity.

1.2 Agro-climatic Relationship.

- Climate plays a major role in deciding what crops can be grown in a particular region.
- Temperature, rainfall, humidity, wind and soil type together influence crop variety, sowing time, growth and yield.
- Different regions of India have different agro-climatic conditions (e.g. tropical, arid, hilly, coastal etc.), so farming practices also vary.
- Understanding local weather patterns helps farmers reduce risk and make better decisions.

Examples of crops suitable for different climates

Climate/Region	Common Crops
Cool and dry (hilly areas)	wheat, barley, peas, apple.
Hot and moist (plains)	rice, sugarcane, maize
Arid and semi-arid	millet, gram, groundnut
Coastal areas	coconut, rice, cashew
Temperate regions	wheat, mustard, fruits



Right crop
in the right
climate!

Climate and agriculture are closely connected.
Farmers observe weather patterns and use this knowledge
to plan their agricultural activities.

Use of Meteorological Data

- Meteorological data gives information about weather conditions.
- Farmers use this data to decide the right time for sowing, irrigation, harvesting and also to protect crops from extreme weather events.
- It is also useful for livestock management, storage of produce and planning farm operations.
- Reliable weather forecasts are provided by organisations like the India Meteorological Department (IMD).

Weather information today = Better harvest tomorrow!

Important Meteorological Parameters

- Temperature → → Affects germination, growth and maturity of crops.
- Rainfall / Precipitation → → Determines water availability for crops.
- Humidity → → Influences disease and pest incidence.
- Wind speed and direction → → Affects pollination, evaporation and spread of pests.
- Sunshine duration → → Important for photosynthesis.



Check Your Understanding

1. Which weather parameter is most important for your region?
2. How can weather forecasts help farmers in your area?
3. Find out a reliable source for local weather updates.

Make Your Own Meteorological Lab

- You can set up a simple weather observatory at home or school.
- It helps you observe and record local weather data regularly.
- The main instruments are:

- Rain gauge - to measure rainfall
- Thermometer - to measure temperature
- Hygrometer (or wet and dry bulb thermometer) - to measure humidity
- Wind vane - to find wind direction.

Observe
Record
Analyse
Learn 😊

1. Rain Gauge

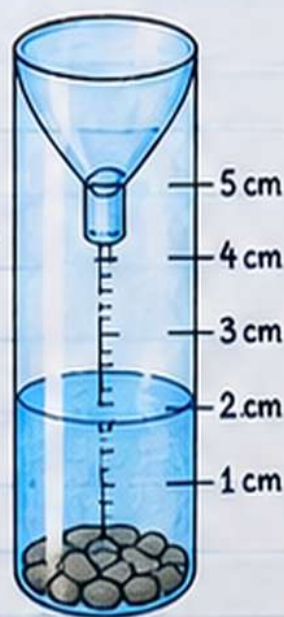
- A rain gauge measures the amount of rainfall in a given time.
- It is a simple instrument that can be made using a plastic bottle.

Materials Required:

- Empty plastic bottle (1-2 litre)
- Scissors
- Ruler
- Marker
- Some pebbles or sand

Steps to Make a Rain Gauge:

- ① Cut the top part of the bottle.
- ② Invert the top part and fix it inside the bottom part (like a funnel).
- ③ Add some pebbles at the bottom for stability.
- ④ Mark a scale (in cm) on the bottle.
- ⑤ Place it in an open area.



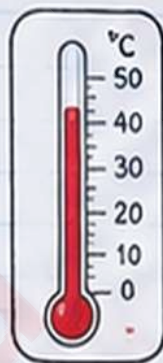
Rain Gauge

Read the water level every day at the same time.
1 cm of water = 10 mm of rainfall.

2. Measuring Temperature and Humidity

(a) Thermometer

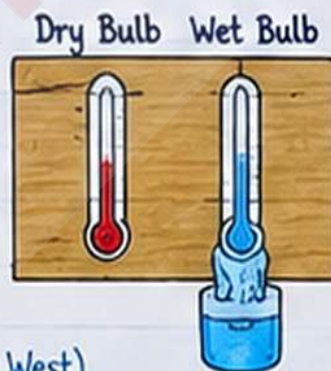
- Measures air temperature.
- Can be digital or mercury/alcohol based.
- Place it in a shaded area, away from direct sunlight.



Thermometer

(b) Wet and Dry Bulb Thermometer (for Humidity)

- Consists of two thermometers:
 - Dry bulb - measures actual air temperature.
 - Wet bulb - covered with a wet cloth (muslin).
- The difference between the two readings helps determine relative humidity (use a humidity table/chart).

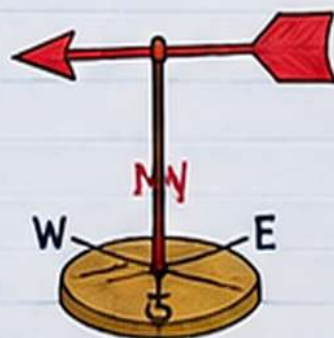


3. Wind Vane

- A wind vane shows the direction of wind (North, South, East or West).
- It can be easily made using cardboard or metal sheet.

Steps:

- ① Cut an arrow and a tail from cardboard.
- ② Fix it on a vertical rod (stick) so that it can rotate freely.
- ③ Mount it on a stand in an open place.
- ④ Mark directions (N, E, S, W) on a base.
- ⑤ Observe the direction in which the arrow points.



Wind Vane

Record your observations daily in a notebook.
Compare the data over a week or a month to find patterns in weather.

1.3 Processes Related to Agricultural Practices

To get a good harvest, we need to follow certain scientific processes like testing soil, selecting good seeds and using suitable inputs. These help in improving productivity and maintaining soil health.

1.3.1 Soil Testing and Amendment

- Soil testing helps us to know the nutrient status, texture and pH of the soil.
- It tells us what nutrients are present in the soil and what is lacking.
- Based on the results, we can add natural or organic amendments to improve soil health.
- Healthy soil supports better plant growth and higher yield.

Why is soil testing important?

- Helps in balanced use of fertilisers.
- Prevents overuse of chemicals.
- Improves soil fertility and structure.
- Saves cost and increases productivity.
- Supports sustainable farming.



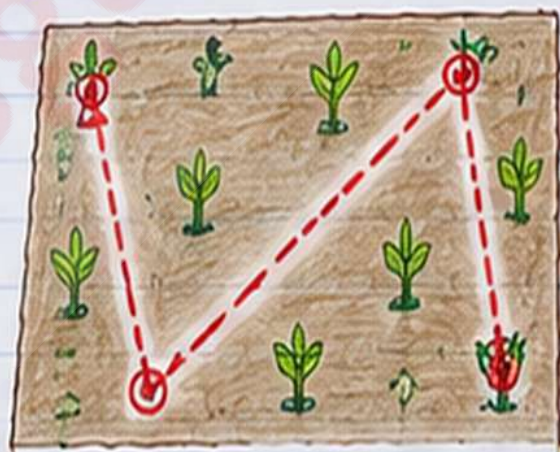
Healthy Soil
Healthy Plants

Soil Sample Collection

- A soil sample should be representative of the entire field.
- Collect soil from 5-10 different spots in a zig-zag pattern.
- Remove surface litter (leaves, stones etc.) and collect soil from 15-20 cm depth.
- Mix all samples, remove large particles and keep about 500 g for testing.
- Use a clean, dry container or plastic bag.

Steps for Collecting Soil Sample

- 1 Select 5-10 spots in the field.
- 2 Remove surface debris.
- 3 Dig 15-20 cm deep.
- 4 Take soil from each spot.
- 5 Mix well and make a composite sample.
- 6 Label and send for testing or use for simple tests at home/school.



Zig-zag pattern for soil sampling



Take samples when the field is dry.
Avoid sampling just after fertiliser application or heavy rainfall.

Mason Jar Test - Testing Soil Texture

- The jar test helps us to find the proportion of sand, silt and clay in the soil.
- Soil texture affects water holding capacity, drainage and plant growth.

Materials Required:

- A clean glass jar with lid
- Soil sample (about $\frac{1}{3}$ jar)
- Water
- A few drops of liquid soap (helps in separating particles)

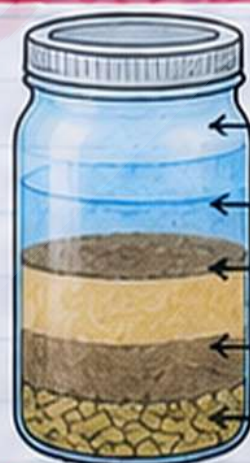
Steps:

- 1 Add soil to the jar ($\frac{1}{3}$ rd).
- 2 Fill with water and add 2-3 drops of soap.
- 3 Close the lid and shake well.
- 4 Let it settle for several hours (or overnight).
- 5 Observe the layers formed.



After shaking

Let it
settle
→



After some hours

Water
Organic matter (light)
Clay (top layer)
Silt (middle layer)
Sand (bottom layer)

Larger particles like sand settle first, followed by silt and then clay. The thickness of each layer gives an idea about the soil texture.

pH Test and Amendment

- Soil pH tells us whether the soil is acidic, neutral or alkaline.
- Most crops grow well in neutral to slightly acidic soil (pH 6.0 – 7.5).
- pH affects the availability of nutrients to plants.



Simple pH Testing (using pH paper or kit)

- Take a small amount of soil and mix it with distilled water.
- Stir well and allow it to settle.
- Dip pH paper in the clear solution or use a soil testing kit.
- Compare the colour with the pH chart.



pH paper test

Soil Amendment

If soil is acidic (pH < 6)

- Add lime, wood ash or crushed eggshells.
- These help in increasing the pH.

If soil is alkaline (pH > 7.5)

- Add organic matter like compost, farmyard manure or leaf mould.
- Use sulphur (in some cases) to reduce pH.

1.3.2 Seed Selection (Beginning)

- Good quality seeds are the foundation of a successful crop.
- Healthy seeds have higher germination rate and give strong plants.
- Before sowing, seeds should be properly cleaned and selected.



Healthy Seeds
Brighter Harvest

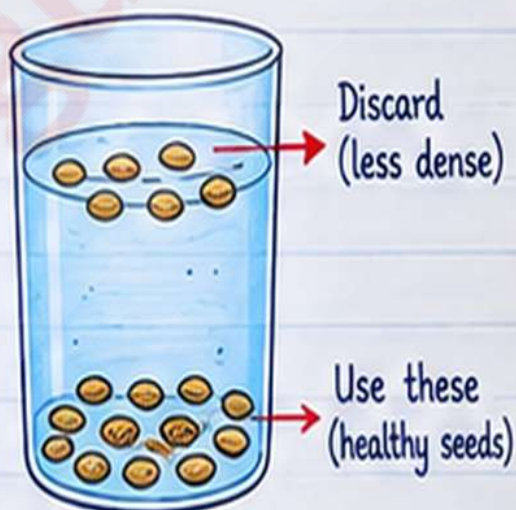
1.3.2 Seed Selection (continued)

Floating Method

- The floating method helps to separate good and healthy seeds from damaged, hollow or insect-infested seeds.
- Good seeds are heavier and sink in water, while poor quality seeds float.

Steps:

- 1 Take a clean container and fill it with water.
- 2 Add the seeds and stir gently.
- 3 Wait for a few minutes.
- 4 Remove the floating seeds (discard them).
- 5 Collect the seeds that sink, wash and dry them before sowing.



Healthy Seeds
Better Germination
Higher Yield

Note: After using this method, also treat seeds with bio-fertilisers or organic solutions before sowing.



1.3.3 Preparing Organic Fertilisers and Pesticides

Vermicompost

- Vermicompost is a nutrient-rich organic fertiliser prepared with the help of earthworms.
- It is made from kitchen waste, crop residue, dry leaves, cow dung etc.
- It improves soil structure, water holding capacity and provides essential nutrients to plants.

Waste to
Wealth



Vermicompost Unit

Steps to Prepare Vermicompost:

- 1 Prepare a pit or container with a layer of dry leaves.
- 2 Add a mixture of organic waste and cow dung.
- 3 Introduce earthworms (e.g., *Eisenia fetida*).
- 4 Keep the material moist (not too wet).
- 5 After 45-60 days, dark, crumbly vermicompost is ready.

- ✓ Recycles waste
- ✓ Enriches soil
- ✓ Eco-friendly
- ✓ Supports sustainable farming

Daśhaparṇī arka (Organic Pesticide)

- Daśhaparṇī arka is a traditional herbal pesticide made from a mixture of leaves of 10 different plants.
- It helps in controlling pests and keeps crops healthy.
- It is safe, economical and environment friendly.

Ingredients (example plants)

Neem, Dhatura, Tulsi, Aak, Arandi, Guava, Papaya, Lemon, Pomegranate, Custard apple (leaves) – (varies by region)



Natural Solution for Healthier Crops

Preparation Steps:

- 1 Chop leaves and crush them.
- 2 Soak in water (1:10 ratio) for 7-10 days in a plastic container.
- 3 Stir daily.
- 4 Filter the liquid and dilute (1:10) with water before spraying.
- 5 Use on plants to control insect pests.

1.4 Selection of Vocation

- Agriculture offers many career and self-employment opportunities.
- With new technologies and innovative methods, young people can explore agriculture as a profession.
- Vocations in agriculture can be chosen based on interest, local resources and market demand.

Examples of Agricultural Vocations

Rooftop gardening



Mushroom cultivation



Aquaponics/
Pisciculture



Backyard poultry



Precision farming
(with drones)



Non-timber forest produce (NTFP)

Exploring Vocations Around Us

- Talk to farmers, experts, local NGOs or agricultural departments.
- Visit farms, nurseries or agri-businesses.
- Use the internet, career fairs and government schemes to gather information.
- Understand the skills, training and investment needed.

Mapping Resources

- Identify the resources available in your area (land, water, climate, market).
- Assess your interests, skills and financial capacity.
- Find out about training programmes and government support.
- Prepare a simple plan before starting any agricultural vocation.

1.5 While Doing Work Related to Agriculture

- Always follow safety measures while using tools and equipment.
- Use weather information to plan farming activities.
- Maintain soil health by regular testing and organic amendments.
- Use good quality, treated seeds for better germination.
- Prefer organic fertilisers and natural pesticides to reduce environmental harm.
- Work carefully and protect yourself from heat, chemicals and insects.



Key Takeaway

- Quality seeds, healthy soil and natural inputs lead to better crops.
- Agriculture provides many vocational opportunities.
- Scientific methods and traditional knowledge can be combined for sustainable farming.
- Safety and environmental care are important while working in agriculture.

