

INTRODUCTION TO AGRICULTURE

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Concept of Agriculture

The word 'agriculture' has been derived from two Latin words: 'ager' means land or field, and 'cultura' means cultivation. So, literally, agriculture means the production of crops for economic purposes **by cultivating soil**. Agriculture may also be defined as the **biological exploitation of soil for the purpose of production**. But in a broad sense, agriculture is the branch of applied science that deals with the production, improvement, protection, processing, marketing and extension of crops through the proper utilization of natural resources. The natural resources are soil, sunlight, air, water, temperature, etc.

A crop is **an organism grown or harvested for obtaining yield, which has economic value**. e.g., rice, fish, cattle, poultry, etc. So, agriculture deals not only with the economic plants but also with the animals, which have economic value.

Branches of Agriculture

There are different branches of agriculture. The major branches of agriculture are as follows:

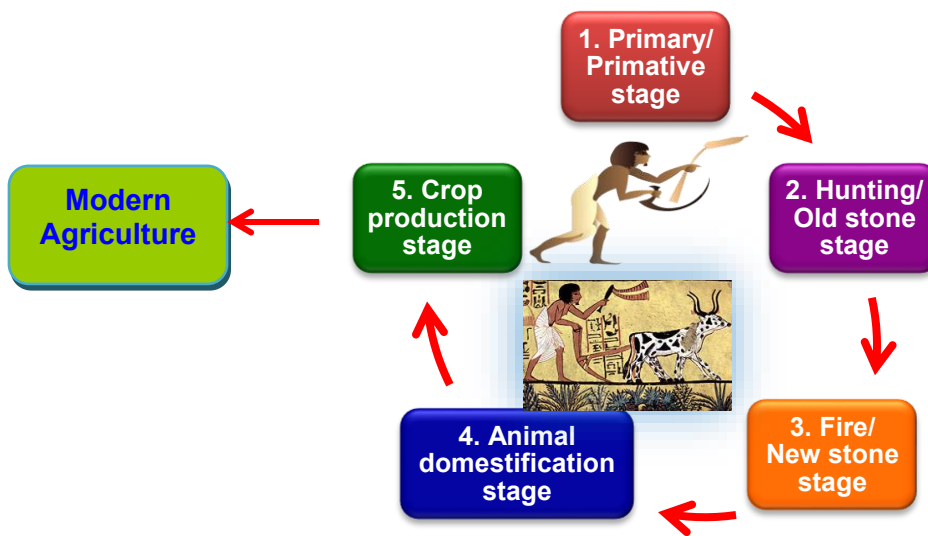
Crop science	• Deals with economic plants . e.g., rice, jute, potato etc.
Animal husbandry	• Deals with animal production , e.g., cattle, buffalo, goat, poultry etc.
Veterinary	• Deals with the diseases and treatments of animal.
Fisheries	• Deals with pisciculture (rearing and managing fishes).
Agricultural engineering	• Deals with farm mechanization .
Agribusiness/Agricultural economics	• Deals with economic management and marketing of agricultural products.

Evolution of Agriculture

Excavations, legends and remote sensing tests reveal that agriculture is 10,000 years old. Women, with their intrinsic insight, first observed that plants grow from seeds. Men concentrated on hunting and gathering (Paleolithic and Neolithic periods) during that time. Women pioneered cultivating useful plants from wild flora.



Evolution of agriculture involves the gradual changes of agriculture from the ancient era to the civilized condition. It involves the following gradual stages:



- 1. Primary/ primitive/ root grabbing stage:** At that stage, human beings came to the earth. People were helpless and nomadic, and they had no houses. They were always afraid of wild animals. They used to take shelter together in caves, earth-holes, and branches of trees to escape from wild animals. They had no idea about food and crop production and used to live on natural fruits and roots.
- 2. Hunting and old stone stage:** Before that stage, people used to face wild animals during collection of natural fruits and roots. At that stage, people had learned to save themselves from the wild animals by throwing large-sized stones at those animals. They learned to make arms by breaking large sized stones for hunting. They used to eat the flesh of wild animals. Gradually, women used to collect fruits and roots from near their households. Thus, they started to eat fruits and roots instead of the flesh of wild animals. Women started to wear animal skin.
- 3. Fire and new stone stage:** At that stage, people were able to make fire and prepare improved arms. They got the idea of making fire when they used to break the large-sized stones into small pieces. They were able to make sharp, pointed tools by rubbing one stone against another. People learned to burn the flesh of wild animals and began eating it. Thus, the people's insecure condition gradually changed.
- 4. Animal domestication/ husbandry stage:** At that stage, men became expert in hunting wild animals. They used to hunt more than one animal and eat them as needed. Excess and gentle animals were kept for future use. Thus, animal domestication was started. Less strong animals like cattle, goat, sheep, dog, ass, etc. were domesticated first. Women and children used to take care of and manage feed for those animals. Thus, animal husbandry was started first. They used to eat natural fruits and roots and did not know how to produce them. So, people used to move from one place to another to obtain food and animal feed.
- 5. Crop production stage:** After thousands of years, people wanted to settle down in a permanent site, as nomadic life was unbearable. People observed that plants sprouted from maize seeds buried in the graveyard. Probably women, by their intrinsic insight, nurtured the sprouts to harvest near households. Thus, women are the pioneers of agriculture. Then people began to use fire and to dig the land with sticks to prepare garden plots where they would grow small grains. They began cultivation using pointed sticks and tree branches.

Modern agriculture started in the 18th century.

Green Revolution started in the 1960s.



Importance of Agriculture

Agriculture is directly or indirectly contributing to many sectors of our basic needs or livelihoods, which are described under the following heads:

1. Food

Food is essential for normal growth and development, the maintenance of body functions, and energy production. Agriculture provides most of the major nutrients required by humans, including carbohydrates, proteins, fats, vitamins, and minerals.

1. **Carbohydrates:** Cereals such as rice, wheat, and maize are major sources of carbohydrates, generally containing about 65–80% carbohydrate. Root and tuber crops are also important sources; fresh potato contains about 17–20% carbohydrate, while sweet potato contains approximately 20–25%.
2. **Proteins:** Important agricultural sources of protein include meat and fish (approximately 18–25%), eggs (about 12–13%), and milk (about 3–3.5%). Pulses are particularly rich plant sources of protein, generally containing about 20–28% protein, although some pulses may contain higher amounts.
3. **Fats and oils:** Oilseed crops are major sources of edible fats. Approximate oil contents include mustard and rapeseed (35–45%), soybean (18–22%), groundnut/peanut (40–50%), sunflower (35–50%), and sesame (45–55%).
4. **Vitamins and minerals:** Fruits and vegetables are major sources of vitamins, minerals, antioxidants, and dietary fiber. Milk and other dairy products also provide important nutrients, particularly calcium, phosphorus, and several vitamins.

Thus, agriculture plays a fundamental role in ensuring a balanced and nutritious food supply by providing the major nutrients required for human health and development.

2. Clothes

Agriculture provides us with fiber to make clothes. Worldwide, 70% of fiber comes from cotton (*Gossypium* spp.). Other important agricultural sources of natural fiber include jute, flax, hemp, wool, and silk. Thus, agriculture plays an important role in supplying raw materials for the textile and clothing industries.

6. Houses

Since ancient times, people have constructed houses and shelters to protect themselves from rain, sunlight, wind, storms, extreme temperatures, and other environmental hazards. Agriculture and forestry provide many important materials traditionally used for housing and construction. These include timber, bamboo, straw, thatch, reeds, cane, and natural fibers used for making ropes and mats. In many rural areas, particularly in developing countries, these agricultural and plant-based materials continue to play an important role in the construction of houses, roofs, fences, and other structures.

4. Industry

Agriculture provides raw materials for different industries. Some of the industries in which agriculture supplies raw materials are mentioned below:

- a. **Medicine industry:** Most medicine industries utilize different medicinal plants like arjun, sesame, etc., which are the contributions of agriculture.
- b. **Paper industry:** Bamboo, geoa, straw, etc., are used in paper industries.
- c. **Rubber industry:** Rubber is prepared from the latex of the rubber plant. It is used to prepare tires, tubes and rooms of different vehicles and is also used in different industrial products.
- d. **Soap, candle and paint industry:** Different oils (mustard, sesame, linseed, groundnut), animal fats (goat, cattle), wax of honeybee chamber, turmeric, safflower, etc. are used in this industry.
- e. **Perfume industry:** Volatile oils extracted from different plant parts are used to prepare perfume. This perfume is used directly or for preparing perfumery, medicinal and food materials.
- f. **Beverage industry:** Tea, coffee, Cocoa, etc. are prepared from agricultural raw materials.
- g. **Bakery:** Flour, egg, sugar, oil, etc., agricultural products are used in preparing different bakery products like biscuits, cake, etc.



- h. **Sugar industry:** Sugarcane, sugarbeet, date palm, etc. are used to prepare sugar in the sugar industry.
- i. **Narcotic and chewing industry:** Different agricultural products are used in the narcotic and chewing industry. e.g., tobacco, cocoa, etc.
- j. **Leather industry:** Hide and skin of different animals are used in the leather industry.

5. Fuel

Agriculture provides various materials that can be used as fuels and energy sources. Biomass materials such as fuelwood, jute sticks, crop residues, straw, husks, and dry leaves have traditionally been used for cooking, heating, and other energy purposes. However, their use in brick kilns should be carefully managed because inefficient burning can contribute to air pollution and deforestation.

Fossil fuels such as coal, petroleum, and natural gas originated from ancient organic matter that underwent geological transformation over millions of years. Coal was formed mainly from ancient plant material, whereas petroleum and natural gas originated largely from microorganisms and other organic matter.

Agriculture also contributes to the production of renewable biofuels. Biodiesel can be produced from vegetable oils obtained from crops such as *Jatropha* (*Jatropha curcas*), rapeseed/canola, soybean, sunflower, and oil palm. Bioethanol and biogas are other important forms of renewable energy that can be produced from agricultural crops, residues, and wastes.

6. Earning source

Agriculture is an important source of employment, income, and livelihood. People earn their living through crop production, livestock rearing, fisheries, forestry, agricultural processing, transportation, marketing, and other agribusiness activities. Agricultural products may be sold in local and domestic markets or exported to international markets, thereby generating income for farmers, traders, processors, and the country as a whole.

Agriculture remains a major source of employment in Bangladesh, particularly in rural areas. According to the Bangladesh Bureau of Statistics (BBS), Labor Force Survey 2024, about 44.67% of the country's employed population is engaged in agriculture, forestry, and fishing. In rural areas, these sectors account for about 56.9% of total employment.

7. Foreign currency

Agriculture contributes to foreign exchange earnings through the export of agricultural commodities and their processed products. Bangladesh exports a variety of agricultural and agro-based products, including raw jute and jute products, frozen fish and shrimp, tea, vegetables, fruits, potatoes, spices, and processed food products. The export of these commodities generates foreign currency, supports farmers and agribusinesses, and contributes to the national economy.

8. International relations

The export and import of agricultural commodities promote international trade and help strengthen economic and diplomatic relations among countries. Bangladesh exports various agricultural and agro-based products, including tea, shrimp and other fishery products, raw jute, and jute products. At the same time, the country imports agricultural commodities such as edible oils, pulses, wheat and other grains, spices, and various fruits, including apples and grapes.

Thus, international trade in agricultural products helps countries meet domestic demand, earn foreign exchange, access commodities not produced domestically in sufficient quantities, and develop mutually beneficial relationships with trading partners.

9. Revenue income

Agriculture contributes to government revenue and national income through land-related taxes and fees, as well as through the processing, marketing, and trade of agricultural products. More importantly, agriculture makes a substantial contribution to the country's Gross Domestic Product (GDP).

According to the Bangladesh Bureau of Statistics (BBS), agriculture, forestry, and fishing contributed about 11.38% of Bangladesh's GDP at current prices in FY 2022–23, of which crops and horticulture contributed 5.51%.

10. Natural beauty

Flowers, ornamental grasses and plants bring natural beauty, a contribution of agriculture. Such as roses and jasmine.



11. Environmental balance

Plants liberate O_2 and animals liberate CO_2 into the atmosphere, and thus the atmospheric gas concentrations are balanced. Agriculture helps in environmental balance by producing plants and animals.

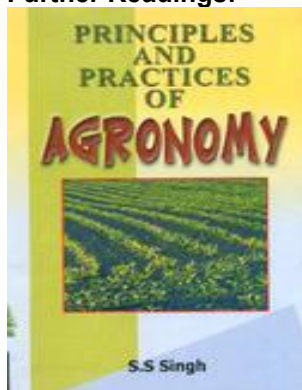


Bangladesh's Success in Agriculture

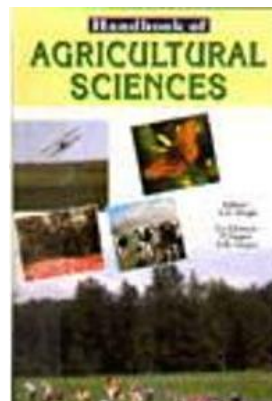
Bangladesh has achieved a remarkable position in global agricultural production despite its limited land area and high population density. According to an analysis based on data from the Food and Agriculture Organization of the United Nations (FAO), Bangladesh ranked among the top 10 countries in the world in the production of 22 agricultural commodities. These include important crops such as rice, jute, potato, onion, lentil, tea, garlic, mango, guava, pumpkin, and several other fruits and vegetables. This achievement highlights the significant contribution and productivity of Bangladesh's agricultural sector.



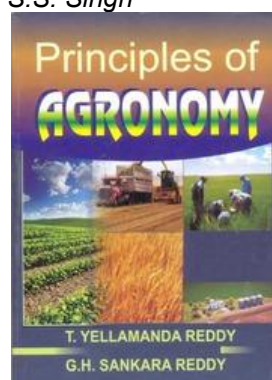
Further Readings:



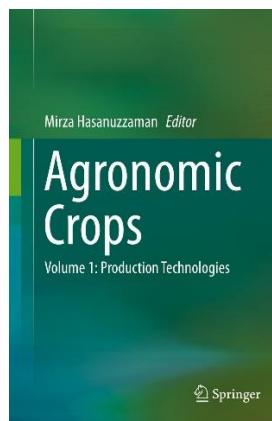
Principles & Practices of Agronomy
S.S. Singh



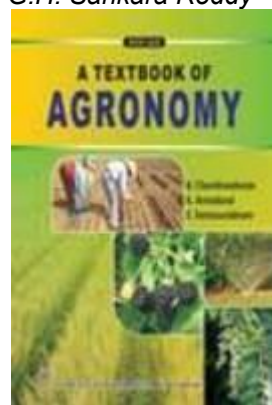
Handbook of Agricultural Science
S.S. Singh
P. Gupta
A.K. Gupta



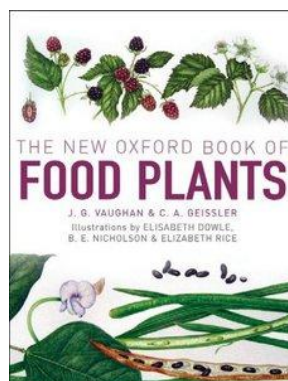
Principles of Agronomy
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G.H. Sankara Reddy



Agronomic Crops Volume 1: Production Technologies
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The New Oxford Book of Food Plants
J.G. Vaughan
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