

➤ Introduction



Agriculture is a Latin word from which agriculture is derived. The first half word is agri of agricultura means field and the second half cultura means growing or cultivation. By combining these two words agri and cultura we get the word agricultura which is converted into word agriculture according to Late Middle English. Agriculture is not only just growing of crops it is also rearing of animals. Rearing of animals is often called livestock.

we can see as

Agri+culture – Cultivation of soil.

Seri+ culture- Cultivation of silkworm.

Pisi + culture – Which deals with fish growth.

Viti + culture – Which deals with grapes crop.

Horti + culture – This deals with fruits and gardening.

Farming is an integral part of the Indian economy. With technological advancements and improvements in various structures, there has been a gone debate between traditional

approaches to farming and modern approaches to farming which leaves the farmers and consumers stuck to choosing what over which?

Agriculture is the industry that provides food, which is the most basic human necessity. Agriculture was closely associated with civilizations all over the world, and international economies were predominantly agricultural during the post-industrialization period.

Agriculture is the practice of cultivating plants and livestock in order to provide facilities the human beings. In the rise of the sedentary human lifestyle agriculture was the key development. The cultivation of plant and food grains began years ago in order to provide food to the city population. Agriculture is the main need for the people to live in the society. Agriculture is the main source of livelihood, it provides a source for the people to earn. Most of the population in the rural areas is dependent on agriculture as their main source of income. Agriculture contributes significantly to a country's GDP that is the Gross Domestic Production of a country. By the passing of time, there are a number of revolutions that take place in order to improve agriculture throughout the world or a country. If we talk about agriculture, India has witnessed a number of revolutions that is, the green revolution, yellow revolution, blue revolution, agriculture. Agriculture affects the biodiversity of a country depending upon agricultural activities. The major agricultural products can be widely grouped into categories of food grains, fibres and raw materials. Food grains included the grains or cereals that have been used for eating. Fibber crops are completely commercial, they can not be eaten and are completely grown for making money. Raw materials are that category of crops that are completely grown for use as raw materials in industries in order to prepare other items. This article provided to help you to learn the topic of agriculture about the history of farming, Commercial farming, primitive farming, its characteristics, types of Commercial Farming, intensive subsidence character, and so on. This will help you to get a clear view of agriculture. Let's have a look at it.

Although traditional agriculture is still practiced in some regions of the world, modernization has changed the face of agriculture. Traditional agriculture relies on outdated

information, outdated tools, and organic fertilizers, whereas contemporary agriculture relies on technologically improved tools and machinery.

▪ Origins Of Agriculture

The origin of agriculture was around ten thousand years ago or approximately four hundred human generations back in time and prehistory, before written records were kept. What is known is based on evidence gathered from archaeological sites. Agriculture started independently in at least three places in the world, each with a distinctive cluster of plants drawn from the local flora: Mesoamerica (Mexico/Guatemala: corn, beans, squash, papaya, tomatoes, chili, peppers), the Fertile Crescent (Middle East from the Nile Valley to the Tigris and Euphrates Rivers: wheat, barley, grapes, apples, figs, melons, lentils, dates), and north China (mid-reaches of the three-thousand-mile-long Yellow River: rice, soybeans, peaches, Chinese cabbages such as bok choy). From these regions and possibly others, notably Africa (sorghum, cowpeas, yams, oil palm), South America (potatoes, sweet potatoes, cassava, peanuts, pineapples), and a broad band of tropical southeast Asia (oranges, mangoes, bananas, coconuts, sugarcane), the invention of agriculture spread to encompass the entire world by two thousand years ago.

The history of agriculture is not that of a single technology to produce food, but of an array of methodologies. Planting seed broadcast across plowed fields typifies most cereals (50 percent of human calories). Vegetables, **legumes**, and corn are planted from seed in rows separated by furrows. Seed agriculture usually consists of annuals that are typically planted as genetically uniform **monocultures**. Agriculture of the humid tropics has been more vegiculture than seed-based. These vegetative **propagated** crops are usually perennials, productive over the entire year and found in **polycultures** that tend to mimic the forest **ecosystem**.

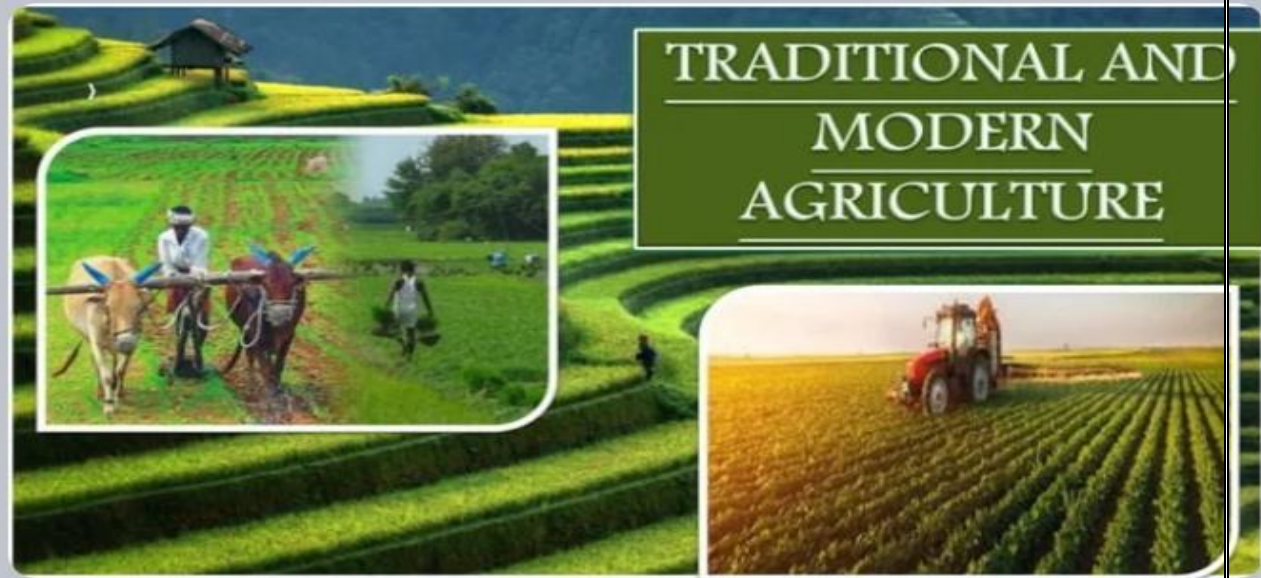
The earliest agriculture of southeast Asia was typically based on roots and tubers such as yams and taro, tree crops such as coconut and banana, and perennials such as sugarcane. In the Americas, vegiculture developed with cassava, sweet potatoes, arrowroot, and peanuts, and

moved up the eastern slopes of the Andes, ultimately domesticating the potato. These crops spread quickly throughout the world after European contact. Potatoes displaced wheat and barley in cold soils of northern Europe and bananas became the fruit of choice in the New World tropics.

❖ *Traditional Agriculture*

Traditional farming are old methods of farming which people have used since earlier times. Over the years, the technology has advanced and modern equipment's are introduced in farming to make it quick and efficient. In spite of the modern farming being used extensively, few methods of traditional farming are still used today and are popular. Inputs that are manufactured in the industry are not much required in traditional farming. Over the centuries, these methods have helped farmers to provide ecological and cultural services to mankind. The preservation of traditional methods of farming has helped in maintaining biodiversity, enhancing food security and protecting the world's natural resources.

Traditional agriculture, the most practised form of agriculture around the world, became commonplace following the two world wars, as it was during that era that knowledge about chemistry greatly increased. Traditional agriculture is based on treating the soil and plants with products that are more likely than not noxious, and more likely than not synthetically produced in a laboratory. These products are used to prevent disease or pests from blighting the plant.



The result is that these products – and the same applies to products used in organic agriculture – find themselves in our food. (Granted, the level is higher in products grown according to traditional agriculture than to organic agriculture.) It has been proven that these products accumulate in our fatty tissues, and when the level is high enough, the chance of developing an illness, like cancer, is higher.



Jean-Paul Jaud's documentary film *Nos enfants nous accuseront* (Our Children Will Accuse Us) traces the life of farmers, children and the people who live near to cultivated fields. Today, cancer is an inheritance in the life of people who live in the countryside. Why do we let this happen?

One of the biggest problems with traditional agriculture is that it kills off life in the topsoil and subsoil. In order to be worth anything, soil needs microflora (bacteria, fungi and actinobacteria) and microfauna (protozoa, nematodes and arthropods). Use of powerful chemical products that destroy or inhibit harmful fungi or fungal spores (fungicides), that kill or inhibit harmful insects and other pests (insecticides) and that control unwanted vegetation (herbicides) has ultimately contributed to the reduction in microbial life in the soil, to the point that, in order to yield sufficient crops, it is necessary to use very large amounts of fertilisers. This all, in turn, results in near-barren land unable to generate its own organic matter. Human has sacrificed their natural resources for economic development from the dawn of Human civilisation to the modern world. In the evolutionary period of agriculture, people used the practice of slash and burn cultivation or shifting cultivation, which is still prevalent in the tribal region of northeast India. Here, we are giving a brief note on traditional agriculture and its impact on the environment, which is very useful for competitive examinations like UPSC, SSC and State Services. Human has sacrificed their natural resources for economic development from the dawn of Human civilisation to the modern world. In the evolutionary period of agriculture, people used the practice of slash and burn cultivation or shifting cultivation, which is still prevalent in the tribal region of northeast India.

- **Characteristics of traditional agriculture**

1. Extensive farming with indigenous knowledge and tools
2. Indigenous tools like axe, hoe, and stick
3. Method: Slash & Burn, and Shifting Cultivation
4. Cattle raising helps to create fallow land
5. Absence of accountability and responsibility to the Environment
6. Lacked by surplus production

Traditional farming practices deforestation.

Deforestation is the process of cutting down trees for agricultural and productive activities. It is the process of removing a forest or a stand of trees from a piece of land to convert it into farms, pastures, or urban usage. Tropical rainforests have the highest concentration of deforestation.

Slash and burn agriculture, commonly known as shifting cultivation, is a type of primitive subsistence agriculture. Crops are planted at predetermined intervals, frequently in between other plants, so that the crop can be staggered to provide sustenance throughout the year.

Depletion of the nutrient content of the soil.

Slash and burn farming depletes the organic matter in the soil and increases the nutrient content of the soil taken up by the crops in a short period. As a result, the farmers are forced to relocate their farming operations to a new location.

Different methods of traditional farming.

- **Agroforestry**

Agroforestry blends agricultural and forestry themes. The idea behind this strategy is to grow trees that can give acceptable climatic conditions for the crops in their area. It controls the temperature, the amount of sunlight and the wind. We profit from this method on our Cow Farm in Chennai since it prevents soil erosion and improves soil quality. These strategy provides a favorable microclimate for the crops, allowing them to produce more.



❖ *Benefits*

Agroforestry systems can be advantageous over conventional agricultural and forest production methods. They can offer increased productivity; social, economic and environmental benefits, as well as greater diversity in the ecological goods and services provided.[17] It is essential to note that these benefits are conditional on good farm management. This includes choosing the right trees, as well as pruning them regularly etc.

➤ **Role in sustainable agriculture****Edit**

Agroforestry systems can provide a number of ecosystem services which can contribute to sustainable agriculture in the following ways;

- Diversification of agricultural products, such as fuelwood, medicinal plants, and multiple crops, increases income security.
- Increased food security and nutrition by restored soil fertility, crop diversity and resilience to weather shocks for food crops.
- Land restoration through reducing soil erosion and regulating water availability
- Multifunctional site use, e.g., crop production and animal grazing
- Reduced deforestation and pressure on woodlands by providing farm-grown fuelwood

- Possibility of reduced chemicals inputs, e.g. due to improved use of fertilizer, increased resilience against pests,^[18] and increased ground cover which reduces weeds
- Growing space for medicinal plants e.g., in situations where people have limited access to mainstream medicines

According to FAO's *The State of the World's Forests 2020*, adopting agroforestry and sustainable production practices, restoring the productivity of degraded agricultural lands, embracing healthier diets and reducing food loss and waste are all actions that urgently need to be scaled up. Agribusinesses must meet their commitments to deforestation-free commodity chains and companies that have not made zero-deforestation commitments should do so.

- **Crop rotation**



Crop rotation is practiced for planting a variety of crops on the same land at different times of the year. This type of agriculture boosts the land's output. Without the use of herbicides or pesticides, we may increase our production.

Growing the same crop in the same place for many years in a row, known as monocropping, gradually depletes the soil of certain nutrients and selects for a highly competitive pest and weed community. Without balancing nutrient use and diversifying pest and weed communities, the productivity of monocultures is highly dependent on external inputs. Conversely, a well-designed crop rotation can reduce the need for synthetic fertilizers and herbicides by better using ecosystem services from a diverse set of crops. Additionally, crop rotations can improve soil structure and organic matter, which reduces erosion and increases farm system resilience.

❖ *Benefits*

Agronomists describe the benefits to yield in rotated crops as "The Rotation Effect". There are many benefits of rotation systems. The factors related to the increase are broadly due to alleviation of the negative factors of monoculture cropping systems. Specifically, improved nutrition; pest, pathogen, and weed stress reduction; and improved soil structure have been found in some cases to be correlated to beneficial rotation effects.

Other benefits of rotation cropping systems include production cost advantages. Overall financial risks are more widely distributed over more diverse production of crops and/or livestock. Less reliance is placed on purchased inputs and over time crops can maintain production goals with fewer inputs. This in tandem with greater short and long term yields makes rotation a powerful tool for improving agricultural systems.

- **Soil organic matter**

The use of different species in rotation allows for increased soil organic matter (SOM), greater soil structure, and improvement of the chemical and biological soil environment for crops. With more SOM, water infiltration and retention improves, providing increased drought tolerance and decreased erosion.

Soil organic matter is a mix of decaying material from biomass with active microorganisms. Crop rotation, by nature, increases exposure to biomass from sod, green manure, and various other plant debris. The reduced need for intensive tillage under crop rotation allows biomass aggregation to lead to greater nutrient retention and utilization, decreasing the need for added nutrients.[6] With tillage, disruption and oxidation of soil creates a less conducive environment for diversity and proliferation of microorganisms in the soil. These microorganisms are what make nutrients available to plants. So, where "active" soil organic matter is a key to productive soil, soil with low microbial activity provides significantly fewer nutrients to plants; this is true even though the quantity of biomass left in the soil may be the same.

Soil microorganisms also decrease pathogen and pest activity through competition. In addition, plants produce root exudates and other chemicals which manipulate their soil environment as well as their weed environment. Thus rotation allows increased yields from nutrient availability but also alleviation of allelopathy and competitive weed environments.

Carbon sequestration

Studies have shown that crop rotations greatly increase soil organic carbon (SOC) content, the main constituent of soil organic matter. Carbon, along with hydrogen and oxygen, is a macronutrient for plants. Highly diverse rotations spanning long periods of time have shown to be even more effective in increasing SOC, while soil disturbances (e.g. from tillage) are responsible for exponential decline in SOC levels. In Brazil, conversion to no-till methods combined with intensive crop rotations has been shown an SOC sequestration rate of 0.41 tonnes per hectare per year.

In addition to enhancing crop productivity, sequestration of atmospheric carbon has great implications in reducing rates of climate change by removing carbon dioxide from the air.

Nitrogen fixing

Rotating crops adds nutrients to the soil. Legumes, plants of the family Fabaceae, for instance, have nodules on their roots which contain nitrogen-fixing bacteria called rhizobia. During a process called nodulation, the rhizobia bacteria use nutrients and water provided by the plant to convert atmospheric nitrogen into ammonia, which is then converted into an organic compound that the plant can use as its nitrogen source. It therefore makes good sense agriculturally to alternate them with cereals (family Poaceae) and other plants that require nitrates. How much

nitrogen made available to the plants depends on factors such as the kind of legume, the effectiveness of rhizobia bacteria, soil conditions, and the availability of elements necessary for plant food.

- **Mixed Cropping**

In such circumstances, mixed cropping is used. On farms, two or more crops are planted together. Row cropping, in which a single crop is cultivated in each row on the farm, is also an option for farmers.

The cultivation of crops alongside the rearing of animals for meat or eggs or milk defines



mixed farming. For example, a mixed farm may grow cereal crops, such as wheat or rye, and also keep cattle, sheep, pigs or poultry. Often the dung from the cattle serves to fertilize the crops. Also some of the crops might be used as fodder for the livestock. Before horses were commonly used for haulage, many young male cattle on such farms were often not butchered as surplus for meat but castrated and used as bullocks to haul the cart and the plough.

• Poly culture

Poly culture is a system to grow many plants of different species in the same area. It increases the plant biodiversity and helps in promoting the diversity in diet in local communities that are adaptable to the climate variation and extreme weather conditions. The various types of poly culture are cover cropping, perma culture and integrated aqua culture.



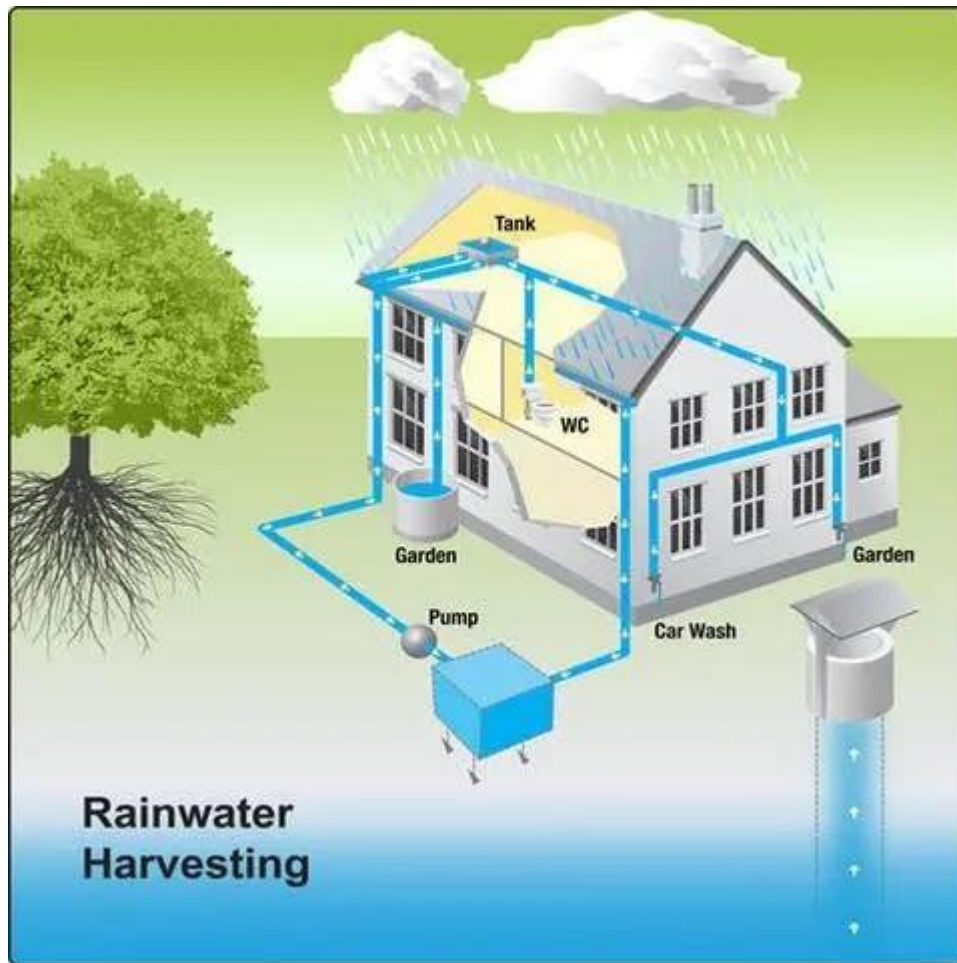
The main advantage of poly culture is its ability to control weeds, pests and diseases without the usage of chemicals. The opposite of monoculture is poly culture which is the sustainable form of agriculture. It helps in reducing soil erosion and increase in stable yields. It improves the quality of soil. Hence poly culture being the traditional method is still popular today across the world as it provides health and environmental benefits

Polyculture has traditionally been the most prevalent form of agriculture.[3] A well-known example of historic polyculture is the intercropping of maize, beans, and squash plants in a group often referred to as "the three sisters". In this combination, the maize provides a structure for the bean to grow on, the bean provides nitrogen for all of the plants, while the squash suppresses weeds on the ground. This crop mixture can be traced back several thousand years to civilizations in Mesoamerica and is representative of how species in polycultures sustain each other and minimize the need for human intervention.[4] Integrated aquaculture, or the growing of seafood and plants together, has been common in parts of Eastern Asia for

several thousand years as well. In China and Japan, for example, fish and shrimp have historically been grown in ponds with rice and seaweed.^[5] Other countries where polycultures have traditionally been a substantial part of agriculture, and continue to be so today, include those in the Himalayan region, Eastern Asia, South America, and Africa.^[6]

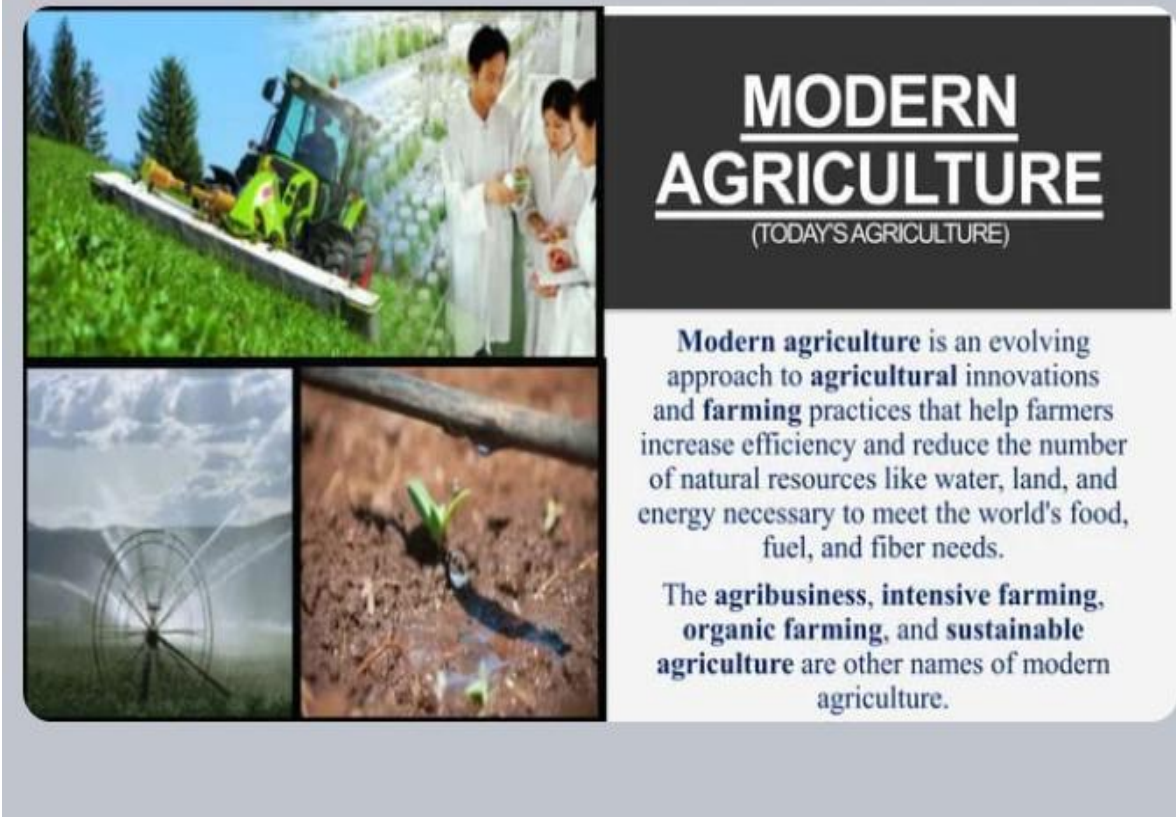
Because of the development of pesticides, herbicides, and fertilizers, monoculture became the predominant form of agriculture in the 1950s.^[7] The prevalence of polycultures declined greatly in popularity at that time in more economically developed countries where it was deemed to yield less while requiring more labor. Polyculture farming has not disappeared entirely, and traditional polyculture systems continue to be an essential part of the food production system today.^[6] Around 15% to 20% of the world's agriculture is estimated to rely on traditional polyculture systems.^[3] The majority of Latin American farmers continue to intercrop their maize, beans, and squash. Due to climate change, polycultures are regaining popularity in more-developed countries as food producers seek to reduce their environmental and health impac

- **Water Harvesting**



Method used to collect and store rainwater which can be used later for agricultural purpose is 'water harvesting'. It is either collected from a roof like surface or stored deep pit in a well. During monsoon season, the water is collected from streams or a river which is later used by farmers in times of drought or limited rainfall. To increase the sustainable production of farm and food security, new methods are being developed in water harvesting.

Water harvesting is the collection of runoff for productive purposes. Instead of runoff being left to cause erosion, it is harvested and utilized. In the semi-arid drought-prone areas where it is already practised, water harvesting is a directly productive form of soil and water conservation. Both yields and reliability of production can be significantly improved with this method. Water harvesting (WH) can be considered as a rudimentary form of irrigation (in some areas water harvesting for agriculture is called runoff farming). The difference is that with WH the farmer (or more usually, the agro-pastoralist) has no control over timing. Runoff can only be harvested when it rains. The basic water harvesting systems involve an external contributing



area to induce runoff. This area is physically or chemically treated for maximizing runoff. The water is diverted into a receiving area comprising of cultivated plots, individual trees or small terraces. The contributing area may lie in the agricultural field (a system sometimes referred to as "conservation bench terrace") or outside the field in the natural watershed system. In the Avdat photo the small valley is a watershed system experiencing flash flood once or twice a year.

❖ *Modern Agriculture*

Modern farming methods refer to a type of agricultural production that involves a lot of money, manpower, and a lot of farm equipment like threshers, winnowing machines, and harvesters, as well as a lot of technology like selective breeding, insecticides, chemical fertilizers, and pesticides.

The impact of modern farming on the environment is as follows.

1. Modern farming leads to soil erosion.

Soil erosion is the removal of the top fertile layer of the soil. Modern farming leads to soil erosion as repeated deep ploughing is used to turn over the ground, and heavy rains can carry the top fertile soils leaving the ground unfit for cultivation.

2. Modern farming evokes the production of fuels.

Modern methods of farming use chemical fertilizers for the yields to grow which on the other hand leads to a rise in having fuels that cause greater damage to the environment.

3. Animals life's are at stake.

All animals are packed together indoors on most "modern" farms. Feeding them necessitates complex machines, while disease prevention necessitates constant treatment. The cruelty involved in today's farm animal management, breeding, growing, and murdering is utterly ugly and horrible.

Modern Agriculture covers a broad scope of multidisciplinary and interdisciplinary fields that encompass the parts of natural, economic and social sciences that are used in the practice and understanding of agriculture. The scope ranges from agricultural engineering to informatics, agroecosystems, biotechnology, soil, chemistry, breeding of crops, livestock and aquaculture etc. The content will provide a holistic view of the innovative agriculture and the wider societal impact of agricultural innovations thus touching on solutions to grand social challenges for 1.

1. Hydroponics



The hydroponics method of farming uses less soil and does not require any form of soil. The process requires growing healthy plants without the use of solid media, employing nutrients such as a mineral-rich water solution. Hydroponic farming is a subset of hydroculture, and the nutrients employed

in these systems come from a variety of places.

2. Aeroponics

Aeroponics is a method of growing plants without the use of soil in an air or mist environment. It is a subtype of hydroponics that works by suspending the plant root in the

air. Farmers will have more control over the amount of water they consume if they utilize this strategy.



3.Monoculture

This approach requires the cultivation of a single crop in a specified farming region. In a country like India, however, the Monoculture farming approach isn't extensively used. Monoculture refers to indoor farming, such as the cultivation of therapeutic plants. Monoculture is a modern agricultural approach in which only one crop or plant is produced.

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➤ Traditional Farming and Modern Farming

Agriculture, generally known as farming, is a primary activity that creates food security, primary industry, raw materials for the secondary sector, and a variety of other benefits.

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Traditional farming in the Indian context refers to farming that is done with embedded knowledge and wisdom that has been accumulated over many generations of experience. The majority of information is conveyed via visual and aural instructions. It is often well adapted to the circumstances of the area. The gene pool that was employed was developed in-house and was well acclimated to the local environment. It is said to be more self-sufficient. Traditional agricultural practices, on the other hand, have received less attention in terms of documentation. Therefore, the current educated population is completely uninformed of it and, as a consequence, unable to appreciate it. When it comes to any activity, it takes a holistic approach and is integrated into the daily lives of those who engage in it.

Farming under the traditional farming system is characterised by the absence of modernization and the absence of any degree of commercialization in the agricultural sector. The use of traditional ways, from labour to seeds, is made throughout. It is an old food production technique that has been in use for thousands of years without the benefit of modern technology or advancement. The majority of this sort of farming is done for subsistence purposes. Ploughs and other conventional agricultural equipment are still in use in the country.

✓ **The following are some of the benefits of Traditional Agriculture:**

- Because we can utilise natural manures such as vermicompost and cow dung manure instead of chemical fertilisers, we can save money on fertilisers
- Because of the absence of chemical fertilisers, there is a reduction in the amount of water required
- Because we are just utilising natural fertilisers, the cultivable area is well suited for the multi-crop style of agriculture
- The old approach has a cheap cost of production since it uses fewer resources
- Because organic farming is used, the food is completely safe to ingest

✓ **Disadvantages of Traditional Farming:**

- Traditional farming requires farmers to spend around 15 hours harvesting their crops, but high-tech farming requires just a few hours

- Because it takes a long time to harvest, it must be sold at a high price in order to recoup the costs of the time spent maturing the crops
- Farming in the traditional manner makes use of soil
- As a result, decomposition consumes the vast majority of available time
- Furthermore, the crops are at a greater risk of contracting soil disease as a result of this
- In order to keep pests from attacking crops, pesticides are applied
- As a result, plants are not in good health

▪ **Modern Farming**

“Modern” farming is a form of farming that disregards this ingrained knowledge and claims to be superior to conventional ways of production. Furthermore, the contemporary is more capital-intensive and large-scale in nature, and it makes little use of the massive gene pool that India has to provide. It is a monoculture that does not take into consideration local resources, context, climate, or other factors, and it sticks out like a sore thumb in the community.

Modern farming refers to the practice of farming employing contemporary methods and technology. Modern science, as well as many new features of discoveries and innovations, make it possible to practise farming. Modern agriculture makes use of modern irrigation systems as well as new sources of capital investment.

Agriculture in the present day offers the farmer a commercialised vocation and a wide range of job opportunities. From drip irrigation to spray irrigation to canal systems to the employment of modern technology for cultivation to harvesting, new methods are being used, as well as high-yielding hybrid HYV seeds being used. Furthermore, the contemporary agricultural system provides sufficient resources and opportunities for side companies, as well as for any service-providing operations, in addition to supporting the principal activity.

✓ **Advantages of Modern Farming**

- Provision of food to the whole public without a lack of food grains
- The land is being used to its full potential (Crop intensity of more than 300 per cent)
- Foodgrain output has increased as a result

- Global Market – even our mangoes are accessible in the United States, and we are importing California apples as well as other fruits
- Because of the growth of factories and the usage of machines, this sector is expanding and creating excellent jobs

✓ **Disadvantages of Modern Farming**

- Excessive use of fertilisers results in soil salinization and depletion of micronutrients
- It results in the creation of a false sense of security
- Modern devices are expensive, and hence out of reach for most people
- The uniqueness of the product is eroding

➤ **Top 5 major differences between Traditional and Modern Farming.**

| Traditional Farming | Modern Farming |
|---|---|
| Traditional farming is mainly based on labor-intensive. | Modern farming is entirely based on capital intensive. |
| Crop rotation, agroforestry, slash, and burn cultivation are some of the techniques which are practiced under traditional farming | Monocropping, and precision agriculture is some of the techniques practiced under modern farming. |
| The traditional method of farming is environment friendly as natural manure is used as fertilizers | Modern method of farming is not environment friendly as chemical fertilizers and pesticides are used. |
| Traditional farming takes a longer duration for a crop to yield as a result the rate of production is | Modern farming is a fast method of farming as it yields the crop at a faster duration, as a result, the |

| | |
|---|---|
| low | rate of production is high. |
| Under traditional farming, high inputs are required | Under modern farming low inputs are required. |