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A Brief Description on Agriculture

Dr Ashok Yadav

SOA, Sanskriti University, Mathura, Uttar Pradesh, India

Email Id- dean.soa@sanskriti.edu.in

ABSTRACT: ***Agriculture has played a crucial role in the rise of human civilization. For decades, agriculture has been the most popular activity among people. Agriculture employs a large number of people, making it the most widely employed sector. Soil erosion, insufficient storage facilities, and irrigation are some of the problems of agriculture. Agriculture is the science and practise of growing plants and raising livestock. Pastoral farming, shifting agriculture, mixed farming, nomadic agriculture, commercial agriculture, intensive and extended farming, and many more techniques or activities are all part of agriculture. This review discusses the introduction of agriculture, types of agriculture, role of agriculture in development, as well as new agricultural technologies in modern farming such as indoor vertical farming, farm automation, and blockchain. This study is helpful for people who have interest in agriculture. In the future, new technology will be brought into the agricultural sector, allowing for the cultivation of higher-quality products while also addressing the problems that come with it.***

KEYWORDS: ***Agriculture, Animals, Cultivation, Crops, Farming, Plants.***

1. INTRODUCTION

Agriculture means cultivation of land. Agriculture, in other terms, is the approach, process, and practise of producing plants and cattle. Agriculture was a significant step in the evolution of sedentary human civilization, since it allowed humans to dwell in cities by creating food surpluses from tamed species[1]. It entails preparing plant and animal goods for human consumption as well as their delivery to markets. Agriculture is responsible for the majority of the world's food and textiles. Agricultural goods include cotton, wool, and leather. Science, technology, and engineering all have a role in agriculture. It is genetic research that is utilized to better the seeds and animals that farmers buy. Everything utilized by farmers, such as tractors, equipment, buildings, and more, is developed, designed, produced, and sold in this industry. Some people believe that agriculture is based on farming, however this is not the case[2]. Agriculture encompasses a wide range of activities, including animal husbandry, cattle, aquaculture, and horticulture, among others.

1.1. Types of Agricultural Practices:

There are several types of agricultural practices that eased farming methods and improved their productivity. The following types of agriculture practices are stated below:

1.1.1. Pastoral Farming:

Pastoral farming is one of the oldest agricultural techniques. Pastoral farming focuses on raising animals rather than cultivating crops, so it's essentially an animal-rearing method that only shows up in cold, humid climates that aren't conducive to crop growth.

1.1.2. Arable Farming:

Arable farming is a form of farming that focuses solely on the production of crops. It has nothing to do with the raising of animals[3]. The primary goal of arable farming is to meet human needs

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by allowing them to cultivate food crops. Arable farming is possible on both local and large-scale agricultural farms.

1.1.3. Shifting Agriculture:

Shifting agriculture is an agricultural method in which crops are grown on forest areas after the forest has been cleared or burned. Migrant's farm on these forest lands until the soil becomes unfit for cultivation. The soil loses its fertility over a period of two to three years.

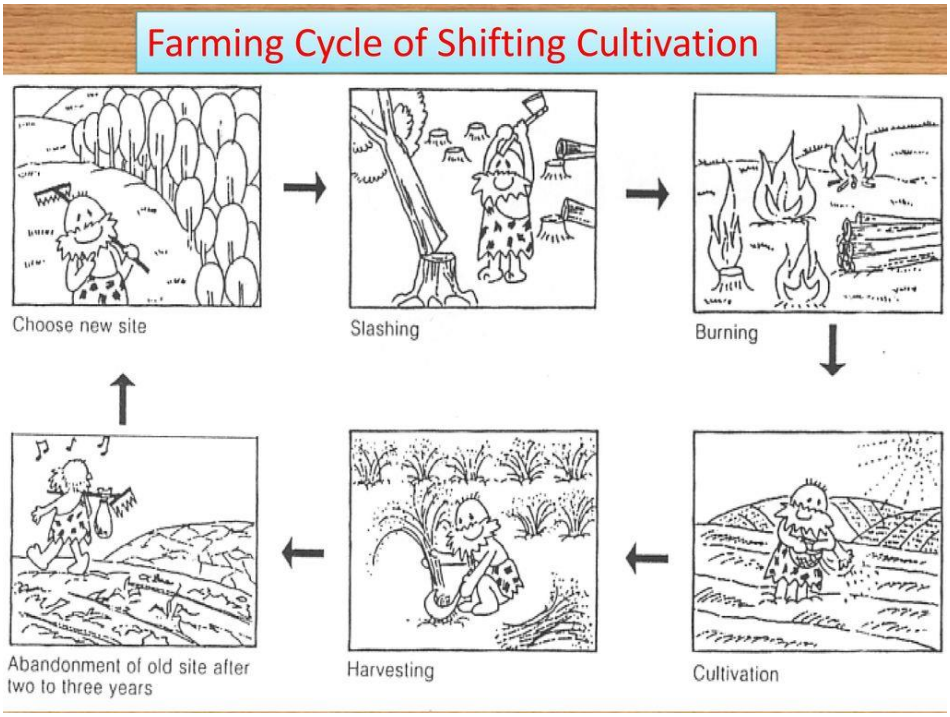

Figure 1: The above diagram shows the farming cycle of Shifting Cultivation[4].

The farming cycle of shifting cultivation is shown in Figure 1. Forests are removed by slashing and the remaining vegetation is burned in Shifting Agriculture, after which cultivation and harvesting take place. The migrants quit these lands after two or three years of cultivating vegetables and gain crops on them[5].

1.1.4. Mixed Farming:

One of the most adaptable farming techniques is mixed farming. It is a sort of agriculture technique that entails the simultaneous cultivation and growth of plants and animals. This is typically done in humid areas. In Europe, it is frequently used.

1.1.5. Nomadic Agriculture:

Nomadic agriculture is a form of agriculture in which nomads graze their livestock on ground covered with green grass and other low vegetation. Nomads and their animals continue to migrate in search of food, water, and green grass. This type of farming is mostly done in arid and semi-arid regions of the world. Goats, sheep, camels, cattle, horses, and donkeys are some of the animals seen in nomadic herds.

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Figure 2: The above diagram shows nomadic herder searching for lands of green grass[6]

Figure 2 shows Nomadic herder searching for lands of green grass. As discussed above, Nomadic Agriculture is a practice in which nomads with animals searches for land covered with grass and other low plants suitable for grazing animals especially cattle or sheep.

1.1.6. Sedentary Agriculture:

In the tropics, sedentary agriculture is quite frequent. It is a form of farming that is utilized or repeated on the same piece of land over and over again. Once the land has lost its fertility, it is left uncultivated for years in order to reclaim it. Sedentary agriculture involves the cultivation of grains and plants.

1.1.7. Subsistence Farming:

Subsistence farming is a type of agriculture that concentrates on the requirements of the farmer and his family. Crop cultivation and animal production are confined to modest scale and little input in this agricultural technique. In this sort of agriculture, ancient and traditional cropping procedures are employed. Small-scale farming is mostly practised by impoverished farmers who cannot afford the most up-to-date technologies and agricultural inputs, resulting in low yields. As a result, the real production is confined to the families of the farmers.

1.1.8. Commercial Agriculture:

Commercial agriculture, often known as industrialized agriculture, is the cultivation of commercial crops and plants for profit. Large landscapes are required for commercial agriculture to generate high-quality crops and plants. Farmers, on the other hand, practise it on a limited scale due to its great commercial worth. Commercial crops include tea, coffee, rubber, coconut, grapes, mangoes, apples, avocado, and palm oil. Because the bulk of commercial crops are tree crops, the planting cost of these crops is considerable.[7].

1.1.9. Intensive Farming:

Intensive farming is often referred to as industrial agriculture or intensive agriculture. Intensive farming is a kind of agriculture in which a large amount of money and labour is spent to enhance the yield per unit of land. This type of farming is often carried out on a big scale, and it contributes to the national economy. Rice is an example of an intense crop that is farmed extensively in various parts of the world.

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1.1.10. Extensive Farming:

Extensive farming, sometimes known as extensive agriculture, is a type of farming that employs low labour, fertilizer, and capital inputs in relation to the amount of land being farmed. Cattle and sheep are reared or grown in low-productive agricultural zones, which are mostly utilized to raise wheat, oil and grain crops, and barley. It is widely used in the United States, Argentina, and Peru.

1.1.11. Crop Rotation:

Crop rotation is a sort of agricultural technique in which cultivation crops are rotated on the same area throughout various seasons. This method aids the soil in recovering its fertility and lost nutrients during an earlier crop harvest. It also mitigates the negative impact of environmental variables on agricultural yield. Crop rotation includes crops such as wheat, turnip, barely, clover, and corn silage.

1.2.Technology in Modern Farming for Agriculture:

1.2.1. Indoor Vertical Farming:

Indoor vertical farming is a contemporary agricultural method that can boost crop yields, alleviate land constraints, and even lessen the environmental effect of farming by reducing the distance travelled in the supply chain. Indoor vertical farming is the technique of producing food in a confined and regulated environment, layered one on top of the other[8]. Instead of planting and growing your crops horizontally across acres of fields, vertical farming allows you to plant and grow them vertically, either stacked in layers or directly on a wall. Because of its capacity to thrive in small spaces, this form of farming is frequently linked with city and urban farming. Some vertical farms are unusual in that they do not require soil for plant growth. Artificial grow lights are utilized in the absence of natural sunshine, as seen in Figure 3.

Figure 3: The above diagram shows the indoor vertical farming[9]

1.2.2.Farm Automation:

Farm automation, often known as "smart farming," is a type of technology that improves farm efficiency by automating the crop or livestock production cycle. Drones, autonomous tractors,

robotic harvesters, automated watering, and seeding robots are all being developed by a growing number of firms. Despite the fact that these technologies are still relatively new, an increasing number of conventional agriculture firms are incorporating farm automation into their operations. Modern agriculture has been dramatically altered by technological breakthroughs ranging from robotics and drones to computer vision software. The main objective of farm automation technology is to take care of the more routine activities.

1.2.3.Livestock Farming Technology:

The traditional livestock business is a vital source of renewable natural resources that we all rely on a daily basis. Traditionally, livestock management has been associated with the management of poultry farms, dairy farms, cattle ranches, and other livestock-related agribusinesses. Livestock managers must keep correct financial records, oversee employees, and guarantee that animals are properly cared after and fed [10]. Digital technology, genetics, Nutritional technologies and other forms of technology can all be used to achieve this goal. Livestock technology can help increase or improve animal and livestock productivity, welfare, and management. The present livestock business may greatly benefit from sensor and data technology. It can increase cattle production and welfare by detecting ill animals and discovering areas for improvement.

1.2.4.Modern Greenhouses:

In recent decades, the greenhouse sector has evolved from small-scale research and aesthetic facilities (such as botanic gardens) to substantially larger-scale facilities that compete directly with land-based traditional food production. Today, large-scale, capital-infused, and urban-centered greenhouses are becoming more common.LED lighting and automated control systems are increasingly being used in modern greenhouses to properly adapt the growth environment.

1.2.5.Precision Agriculture:

Agriculture is changing, and technology is becoming an increasingly important component of every commercial farm. Precision agriculture firms are developing technology that will allow farmers to optimise yields by regulating every aspect of crop production, including moisture levels, insect stress, soil conditions, and microclimates. Precision agriculture allows farmers to enhance efficiency and minimise expenses by providing more precise ways for planting and producing crops.

1.2.6.Blockchain:

The capacity of blockchain to monitor ownership records and resist tampering can be utilised to address important concerns in the existing food system, such as food fraud, safety recalls, supply chain inefficiencies, and food traceability. Food traceability has been at the forefront of current food safety debates, especially in light of recent developments in blockchain technology. The applications of blockchain in the food industry go well beyond guaranteeing food safety. By establishing a ledger in the network and balancing market price, it also provides value to the present market.

1.3.Role of Agriculture in Development:

The agricultural sector has always been critical to development, particularly in low-income nations where the sector is extremely big in terms of both total labour and aggregate income. Agriculture contributes to both poverty reduction and income growth in a nation by giving jobs in various

agricultural sectors in both rural and urban regions, as well as supplying food at affordable rates in rural areas where it is difficult for people to buy expensive food. Agriculture's contribution to poverty reduction is made directly by the effects of agricultural growth on farm employment and profitability, as well as indirectly by an increase in agricultural output that induces job creation in non-farm sectors upstream and downstream as a response to higher domestic demand. People may save money and buy more food for less money when food prices are lower.

Agriculture is the backbone of an economy, providing humans with fundamental foodstuffs as well as raw materials for industrialization. It is especially important in low-income nations, where agriculture employs around 60% of the workforce. Increased agricultural output and productivity are seen to contribute significantly to the country's overall economic development. Agriculture contributes to economic development in a variety of ways, including providing food and raw materials to non-agricultural sectors of the economy, creating demand for goods produced in non-agricultural sectors by rural people using their purchasing power earned from selling marketable surplus, and providing investable surplus in the form of savings and investments. In India, it generates around 17% of India's total Gross Domestic Product (GDP) and employs over 60% of the population.

In a nation like India, which is mostly agricultural and overpopulated, economic disparities between rural and urban regions are more pronounced. It is important to give agriculture a higher emphasis in order to minimise economic disparity. Agriculture's success would improve the income of the majority of the rural people, reducing economic disparities to some extent. The expansion of the agricultural sector is essential since it will tend to enhance agriculturists' buying power, which will assist the country's non-agricultural sector flourish. It will create a market for more production to take place. In poor and emerging nations, agriculture provides a huge number of job possibilities for rural populations. It is a significant source of income. Increased agricultural productivity raises rural population income, which in turn raises demand for industrial products, resulting in the growth of the industrial sector. All of this leads us to the conclusion that agricultural growth is essential for a country's economic success.

2. DISCUSSION

Agriculture refers to the process and practise of growing food and raising livestock. Agriculture has a critical role in ensuring that all people have access to food. Agriculture has recently been the most employed industry in comparison to other industries. Agriculture is responsible for the majority of the world's food and textiles. Agricultural goods include cotton, wool, and leather. Agriculture has a number of problems, including soil erosion, irrigation, and insufficient storage facilities, to name a few. We may overcome these obstacles by embracing new technologies, such as AI systems that can do soil testing and identify lacking nutrients in soil. Crop storage is also made easier with the aid of indoor vertical farming. In this paper, Author has discussed about the various agricultural practices as well as the new technology involved in modern farming.

3. CONCLUSION

Agriculture is a critical component of most emerging countries' rise and development, as well as their economic prosperity and stability. Many major corporations are interested in the agricultural industry because they produce commercial crops on a massive scale. Agriculture has changed dramatically over the last century as a result of the adoption of contemporary technology. Gadgets are now used to analyse soil and monitor a whole field. In this work, the author discusses several agricultural methods. The author has discussed the role of new technology in contemporary

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agriculture in a country's growth. How commonplace foods are prepared and consumed, as well as how rubber, paper, and wines are created through a variety of activities. This study has gone through all of this. Agriculture is important in every aspect since food, housing, and clothing are the essential needs for a human to exist, and agriculture provides all three in some form. Agriculture's future potential is considerably greater than most people realise, since without agriculture, there would be no food, and without food, human life would be impossible. Thus agriculture sector has a great scope in future by adapting new technologies to cultivate good quality crops.

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