



Anjali Sachan

Evolution of Indian Agriculture: From Ancient Practices to Modern Challenges

Research scholar- History, Chhatrapati Shahu Ji Maharaj University, Kanpur (U.P.), India

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E-mail: anjalisachan42810@gmail.com

Abstract: *India is an agricultural land. About 65% of people are engaged in agriculture and allied activities. Agriculture in India is not newly introduced, it is an age-old practiced activity. It provides livelihood to people and plays a crucial role in India's economy. Our ancestors were initially hunter-gatherers, but during the Neolithic age, they started growing crops and became food producers. After that age, agriculture grew tremendously in the ancient, medieval and, modern periods under different dynasties as a result of which today India's economy is agrarian.*

This paper is emphasized on the transition of Indian agriculture from ancient to modern-day India in Northern part of India.

Key words: Agricultural, Livelihood, Hunter-gatherers, Neolithic age, Transition, Crops, Producer, food.

1. Introduction- Agriculture is the process of cultivation to produce crops and provide food to people. There are different views of different scholars about its origin. Some believe the hunters of Natufian culture people in Palestine were the first agriculturists in the world. Perry thought that it began in the Nile River region. It is believed about the Indian subcontinent that agriculture began in the Neolithic period. After the Stone Age, Copper Age is said to have existed which became a boon for humans because it made farming easier. Hand plough was used for tilling as mentioned by R.B. Pandey. The great developments took place in agriculture under the dynasties of ancient, medieval and, modern giving land grants, constructing canals for irrigation, and providing loans to farmers. The rule of foreigners also led to the development of various new techniques in the farming sector.

2. Objective of the study- This study is to explore how agriculture in India evolved from pre-historic to today's modern period in the Northern part of India.

3. Methodology- The historical and analytical view is adopted in the study. This paper is based on the secondary sources available such as translations of books by contemporary scholars, research papers, and government websites.

4. Findings and Discussion of the study- It is written in the Bhagwat Gita, the great Hindu epic, that the Universe is dependent on grains and can't be maintained without it. Agriculture is the 'backbone of Indian economy'. The date of its origin is unclear but its origin is traced to be in the Neolithic period. Since then significant changes happened in agriculture practices. The agriculture during different periods is described below:

Ancient India- i) Agriculture during the Prehistoric Period: The Prehistoric period is broadly divided into three parts: Paleolithic, Mesolithic, and the Neolithic. Paleolithic age is considered to be the age of collecting food and hunting. Humans used to wander always for food. In the Mesolithic age, the people were still food gatherers but started living in the places where they found food and also domesticated animals. Gordon Childe has called the Neolithic age as a food-producing age. From Koldihawa (Uttar Pradesh), the evidence of rice cultivation is found, which is of 6000 B.C. The earliest evidence of rice cultivation is from Lahuradev (Uttar Pradesh) in 9000-8000 B.C. The beginning of agriculture is evident from Mehargarh & Mahgara. Koldihawa, Chopani mando, and food gatherers into food producers. Agriculture was important for the survival of the humans (Sharma et al. 1980a; Sharma, 1985).

Copper was the first metal used by humans and the age is known as Chalcolithic age (4700-4300 B.C.). Technically, this age is before the Indus Valley Civilization, but in chronology, it comes after the Indus Valley Civilization. The introduction of copper facilitated man in agriculture because the implements made of copper made cultivation easier. Wheat, Barley, and Millet (finger millet, pearl millet, foxtail millet) were mainly grown.

ii) Agriculture during the Indus Valley Civilization Period: This civilization was on the bank of the Indus River which could be considered the main reason for the settlement of people there because of the irrigation facility. The excavated cities such as Harappa and Mohenjodaro both had granaries to store the grains. The evidences of wheat and barley are proof of farming during this civilization. A canal system is found at Shortugai which was used for irrigation. The other evidences, of agriculture are the Teracotta plow from Banawali (Haryana) and plowed land from Kalibanga (Rajasthan). Till date nine types of crops of this period have been discovered. During winter (barley, wheat, mustard, linseed, field pea, chick-pea and grass-pea) and in summer (rice, millets, green/black gram, horse gram, sesame and cotton) were cultivated.



iii) Agriculture during the Vedic period and later Vedic Period: During the Rigvedic age, the economy was both pastoral and agrarian. Farming techniques are mentioned in the 4th mandal of Rigveda and its 24 Shlokas are dedicated to farming. The barley, wheat, and paddy were the main crops grown. According to Atharvaveda, the iron plows were used for cultivation. Indra was the God of rain and Vṛtra was believed to create obstacles in monsoon, so the people used to make sacrifices to please Indra against Vṛtra because the good rain was essential for good yield. The wish of the farmers was “As the seeds grown in the fields, in the furrow drawn by the ploughshare, thus in me, cattle and every kind of food shall grow”(Atharvaveda, BK VI, hymn 6, stanza 33). The cow dung was used for manures and it is also practiced today. Farming was being practiced by a large group of the population. As mentioned in Yajurveda, cereals (rice, wheat, barley, millet), legumes (bean, pulses), oilseeds (sesame), cotton, green vegetables, and fruits were cultivated.

In the later vedic period, Farming was the main occupation of Aryans, the description of plough being pulled by 24 oxen is given in Kathak Samhita. Four processes of farming- Ploughing, Sowing, Harvesting, Threshing are mentioned in Satpath Brahman.

iv) Agriculture During the Buddhism and Jainism Period: Gautam Buddha founded Buddhism. The tripitakas: Vinay Pitaka, Sutta Pitaka, and Abhidhamma Pitaka are the main texts of this religion. In Suttanipata (a part of Sutta Pitaka), it is mentioned that a blacksmith made plowshares. The agriculture was not caste restricted, their agricultural lands were across the villages. Gautam Buddha in Dirgha nikaya (a part of sutta pitaka) has said that the King must provide seeds to the farmers, money to traders, and wages to laborers.

In Jainism, the people were engaged in trade mainly. The farming is banned in their religion because they believed that cultivation does violence to lives.

v) Agriculture during the Mauryan Period: Mauryans came into power in 322 B.C. and ruled till 185 A.D. Chanakya, guru of the great Chandragupta Maurya, is credited for his importance in the establishment of this dynasty. His writing, Arthashastra, gives a detailed account of this dynasty. The loan for seeds, ten types of lands, and the engagement of slaves in agriculture are described in it. The Mauryan economy was developed and agriculture was the main revenue source. The farmers were allowed to directly communicate with the King. Rice, coarse grains, sesame, pepper, saffron, pulses, and wheat were mainly cultivated. Junagarh Rock Inscription of Rudradaman first mentions that Pushyamitra Vaisya, the governor of Chandragupta Maurya constructed ‘Sudarshan lake’ for irrigation. Taxila Golden Plate inscription, Sohgaure Copper Plate inscription, and Ashokan Pillar inscription no. 4 and 5 provide evidence about agriculture in developed form during this period.

vi) Agriculture during the Later Maurya Period: The writer of Manusmriti during Pushyamitra Sunga has written that vaisyas were allowed to adopt agriculture. It was flourishing in this age as is evident in many literary and archaeological sources. Pepper, rice, wheat, barley. Millets and lentils were cultivated. Spices were exported to Rome.

vii) Agriculture during the Gupta Period: The Guptas’ reign began in the 4th century AD. Farming was the main occupation of the people. According to Kalidasa, the court poet of Chandragupta II, agriculture and domestication of animals are important for national economic development, and also talked about the cultivation of sugarcane and rice. Twelve types of lands, the husking technique of rice, use of canals and ponds for irrigation are mentioned in Amarkosh of Amarsimha. The agriculture depended on monsoon. Varahmihira in Brihatsamhita had talked about meteorological observations. Cereals, pulses, spices, vegetables, fruits, oilseeds, fibres and dyes were mainly cultivated.

Medieval India- i) Agriculture in the Early Medieval Period (800 – 1200 A.D.): Sena inscriptions from the eighth to thirteenth centuries are evidence of agriculture becoming gradually important for the people. According to R.S. Sharma, agriculture was of primary importance for feudal society, and trade was secondary. Various medieval texts talk about an enormous increase in agricultural production during this period. Several texts such as Krisiparashara of Parasena, Kashyapa’s Krshisukti (a treatise on agriculture by Kashyapa), Lokopakara (for the benefit of people), etc. are about agriculture in this period. Along with the use of Arghatta (the waterwheel), many other changes took place. There are evidences of the increase in cultivation of different varieties of cereals due to innovations and good irrigation facilities. Different political authorities used to donate land to the people of backward areas.

ii) Agriculture during the Delhi Sultanate Period: The contact developed between Hindu and Islamic agriculture systems. The Islamic agrarian system was based on Islamic laws that came into India along with Muslim rulers. The changes in cultivation and cropping patterns were seen. The heart of this



sultanate was in the Indus and upper Gangetic plains. Amir Khusrau had written about the nature of the climate, fertility of the soil, and yields of this time. The crops were cultivated in two seasons: Autumn crops were millet, different beans, and peas and Spring crops such as wheat, barley, lentils and chickpeas. The manure was used to increase the fertility of the soil. Mohammad Bin Tughlaq used to give Takkavi loans to farmers to buy seeds, etc. Ghiyasuddin Tughlaq was the first to build canal for irrigation in this sultanate period but the largest network of canals was created by Firoz Shah Tughlaq as mentioned by him in his autobiography Futuhat-i-Firozshahi: "All agreed that building canals, planting trees, creating land endowments for the welfare of the public, are meritorious acts under the Sharia". For the supply of water to his city Hisar Firoza, built two canals named Rajab-wahi from the Jamuna River and Ulugh-khani from the Sutlej River. Besides canals, he also built 150 dams, 150 wells, and 40 reservoirs for irrigation had been written in tarikh-i-Ferishta by Ferishta. He also planted 1000 orchards.

iii) Agriculture during the Mughal Period: The reign of the Mughals started in India in 1526 A.D. when Babur ascended the throne of Delhi. In his autobiography Tuzuk-i-Babari, he talks about the climate of India. The Mughals introduced new crops in India, such as tobacco, maize, cashew nut, and pineapple. According to Irfan Habib, maize was known as Makai in India and was originally from the Mediterranean region. Zamindars were prominent in this dynasty. Many new technologies were introduced during this period. Babur has written about the use of the Persian wheel and Sakiya. According to Francis Buchanan, drill sowing was in practice. Artificial reservoirs were constructed for irrigation, Shahajahan constructed a canal named 'Nahar-e-Faiz' and also did restoration of Nahar-e-Sahib (built by Firoz Shah Tughlaq) and now this canal is known as 'Nahar-e-Bahist'. Babur and Humayun took forward the legacy of the Sultanate period in the land revenue system. According to Ain-i-Akbari of Abul Fazal, the land revenue system of Akbar was the adoption of Sher Shah Suri's land reforms. Sher Shah Suri had done reforms such as the measurement of land in bighas, and introduced the patta system, the farmers were to deposit directly tax into the treasury. The land reforms of Akbar were fixing of rates, measuring land, and classifying land into four categories: Polaj (cultivated land), Chachar (uncultivated land for more than 3 years), Parauti (uncultivated land for a time), and Banjar (uncultivated land for more than 5 years). The cultivation of commercial crops began during the later Mughals. Indigo was cultivated in Bayana and Sarkhej. Sugarcane was grown in Bihar and opium in Malwa and Bihar.

7. Modern India- i) Agriculture during the Company and Crown Rule: There was a shift from the traditional to commercial farming during this period. This was the period of Industrial Revolution in England and there was a huge demand for raw materials so they began to use their colonies for the fulfillment of their need. Before the colonial period, Indians were engaged in conventional farming. The commercialization of crops happened during this period. The tobacco was introduced in Akbar's court and its cultivation increased rapidly in this period. According to William Methwold, "The cultivation of tobacco on the Coromandel coast was established long enough to produce a crop sufficient for local demand and export to Red Sea-Persian gulf area and to coastal Burma before 1862." Indians were forced to cultivate Indigo on their lands. Pelsart states, "Indigo is sown in June, when the first rain has fallen, at the rate of 14 or 15 lb (0.25 to 0.8 Kg) of seed to the Bigha." Dr William founded Royal Agri-Horticultural Society in 1820. Under this six committees were formed: i) Cotton Committee, ii) Sugarcane Committee, iii) Tobacco Committee, iv) Flax and Hemp Committee, v) Silk and wheat Committee, vi) Livestock Committee. The quality of cotton, flax and hemp, sugarcane, wheat, tobacco, potato, tea, fruits and vegetables was improved. The new implements such as Moullbord ploughs and cultivators, designed in America were used. Efficient machines for cleaning cotton, wind-mill & winding machines were invented. After the battle of Buxar, the company got the Diwani rights and began to exploit peasants. The Bengal famine in 1770 caused the death of about 10 million people due to brutal taxation policies and natural calamity. Later, three land revenue settlements were introduced: Permanent settlement, Mahalwari settlement, and Ryotwari settlement. The zamindars started exploiting farmers due to these reforms. In the late 19th century and early 20th century, there was an increase in the cultivation of non-food crops because the peasants were forced to do so. 2-3 million people died in the Bengal Famine of 1943 due to the supply of grains to British troops. From 1921 to 1946, the growth of Indian agriculture was very poor. The yields were not able to meet the requirements.

ii) Agriculture during Post Independence (1947 onwards): After independence despite developments in irrigation and agrarian reforms, India was not in a condition to fulfill the requirements of the rising population. In 1951, the zamindari system was abolished and land was given to actual farmers. In the mid-1960s, the Green Revolution changed the scenario of Indian agriculture. It achieved milestones in production due to widespread of high-yielding variety seeds and technological advancements. The MSP



(minimum support price) which boosted the adoption of technologies was introduced in 1964. In 1966, 18,000 tonnes of HYV seeds were imported and cultivated in different regions. During the 1980s, the government increased its help to the agriculture sector.

Irrigation facilities also developed rapidly. A department to look after irrigation was constituted in 1952. By 2006, the total irrigation potential was 102.80MH from 23 MH in 1950-51. Dams are important to prevent crop damage from floods. Jawahar Lal Nehru has called dams “Temples of Modern India”. Hirkund Dam on Mahanadi River, Tehri Dam on the Bhagirathi river, and Nagarjuna Sagar Dam on the Krishna River are some major dams built. There was a six-fold increase in agriculture during this period.

Contemporary Agriculture & New Emerging Trends- Today, Agriculture sector’s contribution to India’s GDP is 18% and it employs more than 60% of the population in India. Digitalization has been introduced in agriculture. The digital interfaces are educating farmers, now they share their ideas & can learn about cultivation, climate and new technologies easily. The following are the main emerging trends nowadays:

1. **Organic Farming:** This farming is based on no use of fertilizers, pesticides, growth hormones and for good yield natural manures and biofertilizers are used. It is being adopted by people at a very fast pace. It is leading India towards sustainable agriculture because both are working on same principle i.e., no harm to the environment.
2. **Smart Farming:** The farmers are adopting smart farming through which they can get maximum profit through less effort. The farmers can sell their crops at high prices with the help of new technologies.
3. **Farm-to-Fork Farming:** This concept is of European origin with emphasis on making the food system sustainable and eco-friendly. This trend has become a socio-economic movement in India today. This system encourages local farmers and helps them to sell their produce. FarmerFZ, Crofarm, DeHaat, and Ninjacart are some of the startups.

Government Initiatives-

1. **Parampragat Krishi Vikas Yojana (2015):** This initiative of the government is to promote and support organic farming for sustainable development.
2. **Pradhan Mantri Fasal Bima Yojana (2016):** It is to encourage sustainable agriculture by aiding financially the farmers suffering from loss of crop.
3. **Pradhan Mantri Krishi Sichai Yojana (2015):** Its motto is ‘Har khet ko paani.’ It is for promoting farmers to adopt modern water-saving irrigation techniques.

Challenges- i) Climate Change: Due to increasing global warming, the climate has been changed. There is a lack and uncertainty of rain. The increasing population, inadequate rain, and excessive heat are decreasing groundwater levels. The whole world is in the race to become powerful and exploit nature due to which climate is being adversely affected.

ii) Soil Quality Deterioration: The amount of carbon in soil is decreasing. SOC(soil organic carbon) is essential to retain soil nutrients. The industrial waste is also making soil infertile. People are using excessive pesticides & fertilizers to increase production which is decreasing soil quality.

iii) Low income of farmers: The income of farmers is lesser than the income of the non-agricultural sector. About 16,500 farmers have committed suicide every year in the last 16 years. Agriculture is seen as an inferior profession which is leading the youth away from agriculture.

11. Recommendations- i) Promoting Eco-Friendly Farming: It will help retain the fertility of soil and will not harm the environment by increasing organic yield.

ii) Encouraging Small Scale Farmers: It will increase farmers’ income and poverty will be reduced.

12. Conclusion- India has a very rich history in the agricultural sector. From the early Vedic period to the post-independence period, India has seen massive agricultural reforms throughout its history which had its both positive and negative impacts on the economy and the commoners of the nation. In this paper, we have some findings that apprise us of the ancient practices adopted by the early rulers and can be beneficial if adopted in today's world.

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