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"History of Agriculture System in India: A Legal Perspective"

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Abstract: *Agriculture plays a vital role in India's economy. The Indian agriculture system began as early as 9000 BC. The domestication of plants and animals are reported in the subcontinent by 9000 BC. The farm sector is contributing greatly to the productivity and stability of the country's economy due to which it has been believed that agricultural prosperity is fundamental to national prosperity. The conception of agriculture, however, has been greatly changed during the past fifty years due to the progress in the technique of agriculture system. The question of the history of agriculture is of extreme interest for the insight that it gives us into human cultural processes, into the location of centers of early economic and intellectual advance, and the diffusion of influences as measured by the spread of useful plants. The object of the study is to understand the past life of humanity and also to understand the condition of farmer and agriculture of present life of the times of which we ourselves are a part.*

Keywords: *Agriculture, Farmer, Domestication of plants, Agricultural Reforms & IPR.*

1. INTRODUCTION

Agriculture plays a vital role in India's economy. The Indian agriculture system began as early as 9000 BC. During this period techniques were developed for the settled mode of production in agriculture and wheat, barley and jujube were the popular crops that were domesticated in the subcontinent by 9000 BC. The farm sector is contributing greatly to the productivity and stability of the country's economy due to which it has been believed that agricultural prosperity is fundamental to national prosperity. It accounts for about 18% of India's gross domestic product, provides employment to 58 per cent of her working population[1] and the rural households depend on agriculture as their principal means of livelihood. Agriculture, along with fisheries and forestry, is one of the largest contributors to the Gross Domestic Product (GDP).[2]

New techniques were developed in the Neolithic period to improve the method of agriculture system like threshing, planting crops in rows, cotton spinning and storing grains in granaries. And they passed their improved techniques of agricultural production to the next generation. This transformation of knowledge was the base of further development of agriculture in India.[3] The recognition of the origins and the historic, non environmental limitations on distribution of useful plants which arises from such study has many practical applications today.[4] Hence, it is pertinent to study the system of Indian agriculture in ancient times.

1.1. Ancient Indian Agriculture System in Indus Valley Civilization

Indus Valley civilization relied on the considerable technology achievements of the pre-Harappan culture, including the plough. The farmers of the Indus Valley grew peas, sesame and dates. Rice was also cultivated in the Indus Valley Civilization. The method of agriculture which Indus civilization people practiced was rainfall harvesting. Due to discovery it came into the light that Indus civilization people had a series of massive reservoirs to meet the city's needs during the dry season. The main

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[1] T.C.Sharma, Economic Geography of India, Jaipur: Rawat Publications, 1 (2013).

[2] http://www.ibef.org/industry/agriculture-india.aspx.

[3] http://www.thisismyindia.com/ancient_india/ancient-india-agriculture.html

[4] George F. Carter, *American Anthropologist*, New Series, 48 (1),1(1946).

basis for the Indus valley economy was mixed farming. Irrigation was developed in the Indus Valley Civilization by around 4500BC. As a result of this innovation in irrigation, the size and prosperity of the Indus civilization was grown. Sophisticated irrigation and water storage systems were developed by the Indus Valley Civilization, including artificial reservoirs at Girnar dated to 3000 BC and an early canal irrigation system in 2600 BC.

1.2. Ancient Indian Agriculture in Vedic Period

Cultivation of a wide range of cereals, vegetables, and fruits was common, and animal husbandry was the important means for their livelihood. There was belief that those farmers who are near to nature they must be exceptionally close to God. The importance of seeds was emphasized and a certain sequence of cropping was recommended and the practice of preparation of manure by the cow dung for irrigation was common during this time.

1.3. Ancient Indian Agriculture in Mauryan Empire

The Mouryan Empire (322-185BCE) categorized soils and made meteorological observations for the agricultural use. Other Mauryan facilitation included construction and maintenance of dams and provision of horse-drawn chariots which was quicker than traditional bullock carts. The Greek diplomat Megasthenes (300BC) in his book Indika provides an eyewitness account of Indian agriculture at that time.

He writes, "India has many huge mountains which abound in fruit-trees of every kind, and many vast plains of great fertility. The greater part of the soil is under irrigation and consequently bears two crops in the course of the year. In addition to cereals, there grows millets and different sorts of pulse and rice throughout India. Since there are two monsoons in the course of each year the inhabitants gather in two harvests annually."

1.4. Ancient South Indian Agriculture

The agriculture scene of South India was equally bright in Ancient India. The south people cultivated a wide range of crops such as rice, sugarcane, millets, black pepper, various grains, coconuts, beans, cotton, tamarind and sandalwood, jackfruit, coconut, palm, areca and plantain trees etc. systematic ploughing, manuring, weeding, irrigation and crop protection was practiced for sustained agriculture in South India. Water storage systems were designed during this period. Kallanai (1^{st}-2^{nd} century AD), a dam built on river Kaveri is considered the as one of the oldest water-regulation structures in the world that is still in use.

1.5. Ancient Indian Agriculture in Chola Period

The agrarian society in South India during the Chola Empire (875-1279) reveals that collective holding of land slowly gave way to individual plots, each with their own irrigation system during Chola rule. The Cholas also had bureaucrats which oversaw the distribution of water, particularly the distribution of water by tank-and-channel networks to the drier areas. The growth of individual disposition of farming may have led to a decrease in areas of dry cultivation.[5]

The Indian economy in the pre-British period consisted of isolated and self-sustaining villages on the one hand, and towns, which were the seats of administration, pilgrimage, commerce and handicrafts, on the other. Means of transport and communication were highly underdeveloped and so the size of the market was very small. To understand the agriculture system in pre-British India, it is essential to study the structure and character of the village community, the character of internal and foreign trade, the state of the means of transport and communications.

1.6. Agriculture System during the British Period

The British rule can be divided into two epochs, first the rule of the East India Company ranging from 1757 to 1858, and second, the rule of the British Government in India from 1858 to 1947. The establishment of the British rule itself was a slow and lengthy process, extending over more than a hundred years. The British conquest which started in 1757 with the Battle of Plassey was completed only by 1858. During this period England was passing through the period of changes in the techniques of production which revolutionized manufacturing. The British conquest led to the disintegration of

[5] http://www.ibef.org/industry/agriculture-india.aspx

the village community partly by the introduction of the new land revenue system and partly by the process of commercialization of agriculture. The new land system and the commercial agriculture meant untold exploitation of the Indian peasantry and the country was consequently plagued by frequent famines. The British were not interested in developing India as such. The growth of railways or the spread of irrigation or the expansion of education or the creation of revenue settlements were all initiated with one supreme goal, i.e., to accelerate the process of economic drain from India.[6]

One of the important contributions of the anglo-saxon period is the institution of local government. During this period, the majority of the population lived in small villages' and agriculture being their principal occupation. Each village formed a township and was a unit of local government.

2. THE LAND SYSTEM DURING 1793-1850

The important impact of the British rule is the growth of a new land system in India. In the early period of the East India Company rule, the Company directors were keen on securing the largest possible revenue. This policy was marked by excessive exactions from peasants not realizing that in the process the British were killing the goose that laid the golden egg. But land revenue was a principal source of finance for Company administration in India as also of satisfying the Company directors in England with larger returns every year from their conquest of India. In order to bring about stability in agriculture the British introduced land settlement in 1793. In Bengal and neighboring areas 'permanent settlement' was introduced. The settlement raised the status of revenue collectors to that of private landlords. It fixed land revenue in perpetuity. This was called Zamindari system and the zamindar was required to deposit an enhanced land revenue to the state. Later the British extended the settlement to other states and created zamindars there too but they changed over to 'temporary settlement' under which land revenue could be reassessed after a period ranging between 25-40 years in different states.

Another and a totally different land system was evolved for large parts of Bombay and Madras and subsequently extended to north-eastern and north-western India. According to this system, called the ryotwari settlement, each peasant holding a plot of land was recognized as the land lord and made directly responsible to the state for the annual payment of land revenue.

It may be pointed out that in both cases, the land rents fixed were excessive and both the system were instrumental in the destruction of the organic village community based on custom and tradition. Daniel and Alice Thorner write: "Whereas the zamindari system made the land lords masters of the village communities, the ryotwari system cut through the heart of the village communities by making separate arrangements between each peasant cultivator and the state." Through the introduction of zamindari system, the British were able to create a class of people whose interests were directly tied to British rule in India. But the system helped to create a class of absentee landlords who were more interested in squeezing higher land rents than in real agricultural progress. Excessive pressure of population resulting in a high demand for land helped the zamindars to charge exorbitant rent and numerous other exactions from the tenant-cultivators. The result of the whole change in the land system led to the emergence of subsistence agriculture. Even the ryotwari-system lost its original form and the rigorous, prompt and inelastic demands of high revenue forced peasant-cultivators to sell land to absentee landlords or moneylenders. The British land system introduced by Lord Cornwallis, thus helped the concentration of economic power in the hands of absentee landlords and moneylenders in rural India. It depressed agriculture and the peasantry.[7]

2.1. Commercialization of Agriculture (1850-1947)

Another noteworthy change in Indian Agriculture was its commercialization that spread between 1850 and1947. *Commercialization of agriculture implies production of crops for sale rather than for family consumption.* At every stage of the economic history of the nation, a part of the agricultural output is produced for the market. Then, what distinguished commercial agriculture from normal sales of marketable surplus? It was a deliberate policy worked up under pressure from British industries. By the middle of the nineteenth century, Industrial Revolution had been completed in England. There was a tremendous demand for raw materials, especially cotton, jute, sugarcane, groundnuts, for the British

[6] Gaurav Datt and Ashwini Mahajan, Datt & Sundharam's Indian Economy, New Delhi: S.Chand & Company Pvt. Ltd., 14-19 (2008).

[7] *Ibid.*

industries. By offering a higher bait of market price, the peasants were induced to substitute commercial crops for the food crops as the former were more paying than the latter. Consequently, the peasants shifted to industrial crops and in some districts, the movement for commercial agriculture became so strong that the peasants started buying food stuffs from the *mandis* for their domestic needs. This led to a fall in the production of food and, consequently this period is marked by the occurrence of most terrible famine in the economic history of India. Commercial agriculture was also, to some extent, the result of the mounting demands of the land revenue by the state and excessive rents by the landlords from the peasantry.

The process of commercial agriculture necessitated by the Industrial Revolution was intensified by the development of an elaborate network of railway in India after 1850. Railways linked the interior of the country with ports and harbours, urban marketing centres and thus Indian agriculture began to produce for world markets. Large quantities of wheat from Punjab, jute from Bengal and cotton from Bombay poured in for export to England. The same railways which carried commercial crops from the various parts of the country brought back the foreign machine-made manufactures to India. Thus, railways and link-roads connecting the hinter-land of country with commercial and trading centres were instrumental in intensifying commercial agriculture on the one hand and sharpening competition of machine-made goods with Indian handicrafts, on the other. These factors led to the ruin of Indian industries.[8]

2.2. The New Land System

The British created a class of landlords so as to affix responsibility for land revenue, but the British left the process of rent fixation to the free market mechanism. The increasing demand for land for a growing agricultural population led to an exorbitant increase in rents. Land was transformed in this process to an attractive capital asset. Thus, there was a great desire among the money lending classes to acquire land. The rise in prices of land enhanced the value of the security in the form of land against which peasants could borrow. This led to increase in agricultural debt of the Indian peasantry repeatedly exposed to uncertainties. The high rates of interest charged by the money lending classes made it impossible for the peasants to repay their debts. Gradually lands passed on to the money lending classes. The dispossession of the peasantry by the money lenders added to the process of pauperization of the cultivating classes.

Thus, the new land relations which embodied the creation of a class of land owners and a class of cultivators (whether on a tenancy basis or a daily wage) separated ownership from cultivation. The land lords were interested in extracting high rents leaving a pittance with the cultivators. The investment on land fell sharply because the cultivators had to part off with a major portion of the produce in the form of rent to the landlords and interest to the money lenders. This created in Indian agriculture a built-in-depressor. Thus, the new agrarian relations were disincentive-ridden and therefore, retarded the process of agricultural development.[9]

2.3. Agriculture System in Modern India

India's agricultural growth in the twentieth century has been low compared to that in other developing countries. However, there have been some important developments in the agricultural sector in this period. On the eve of independence, India had to face the serious problem of food shortage. The partition had given a severe blow to the food grain production. Food grains had to be imported from outside as agricultural production did not suffice with the minimum requirements of the population. Therefore, agricultural development was given top most priority to attain self sufficiency in food grains so as to feed the teeming millions. As was aptly stated by Pandit Jawahar Lal Nehru after Independence "everything else can wait but not agriculture", and this perspective was reflected in several public policies and investment decisions particularly with regard to irrigation, fertilizers, production, land reforms and community development.

The Green Revolution in India was the outcome of the systematic application of improved agricultural technology for crop production. Introduction of hybrid and high yielding varieties of seeds brought about the real technological breakthrough in the agricultural arena. This innovation came at a critical juncture when India was seething under the successive droughts of 1965-66 and 1966-67.

[8] *Ibid.*

[9] *Ibid.*

The new agricultural technologies like biotechnology and green revolution were introduced by using high yielding varieties, mechanization of agriculture, large scale utilization of fertilizers and pesticides in irrigated areas. Green Revolution did clearly exert a positive impact on the agricultural economy of the country. The initiatives and incentives provided to induce agricultural prosperity through new agricultural technology did culminate in record gain output.

However, the introduction of 'Green Revolution', agriculture has undergone many changes impacting the environment and society. The Green Revolution had reduced genetic diversity by promoting wheat rice monoculture on a narrow and alien genetic base. The major implications of 'green revolution' are as follows;

- Shifting cultivation, conversion of forest land to agricultural land, mono cropping and overgrazing.
- With green revolution and adaptation of HYV (high yielding varieties) the application of pesticides has shot up substantially over time.
- Through food chain, these toxic chemicals enter the livestock and human bodies and cause various health hazards.
- Increased irrigation for rice based cropping system further enhances the existing problem of water logging in coastal areas.

The Green Revolution of 1960s had, in its initial years, brought more cultivable land resources to the fold of agriculture arable land and augmented per hectare productivity of cereals. In the absence of a continuous follow up to the Green Revolution and the dearth of a suitable technological breakthrough in Indian agriculture in the Post Green Revolution Era, there has been a continuous decline in the total factor productivity in Indian Agriculture. India will not be able to maintain a stable food security system if the heartland of Green Revolution is not saved through adequate support for conservation farming and green agriculture.

2.4. Evolution of Plant Innovation and Protection

Historically the appropriation of plant innovation was on the basis of whole organisms with respect to their reproductive capacity according to the plant variety rights system. The development of biotechnological methods to extend human inventive activity and biological description to the manipulation of sub-cellular components of biological systems challenged this form of plant appropriation. The precise means to manipulate plant biology has become part of our technical knowledge. The patent system itself is liable to be traced back almost five hundred years ago. However, it was only recently that the western world took an 'inventive' approach to the patent regime.[10] As a result patents have been granted for genes, proteins, biological processes as well as whole organisms, including varieties. The priority for the developing countries were however not on 'inventiveness' but in the creation of new industries and 'investments'.[11]

The subject-matter of plant varieties is also still evolving. Mere discovery of a new variety has been removed as means to gain variety protection. The history of intellectual property protection for plant innovation is characterized by a variety of efforts to fit plant innovation into traditional regimes- trade mark/unfair competition regimes as well as patent regimes- followed by a gradual shift towards *sui generis* "plant variety" regimes. The *sui generis* regimes can best be analyzed against this mosaic of predecessor trademark and patent proposals.

The issues of ownership and control of plant genetic resources were the source of international conflict at the 1992 United Nation Environmental Conference in Rio, where US opposition to provisions on intellectual property rights in a proposed international treaty on biodiversity brought legal control of plant genetic resources to world attention.[12]

[10] Hugh Brett,"Western World, Patent Reflect a Reward for Innovativeness and research" Opinion, EIPR, 99 (1980).

[11] Robert A. Armitage, "The Emerging US Patent Law for the Protection of Biotechnology Research Results". EIPR, 11(2), 47-57 (1989).

[12] Neil D. Hamilton, "Who Owns Dinner: Evolving Legal Mechanisms for Ownership of Plant Genetic Resources, 28 Tulsa L.J.587.

3. CONCLUSION

India as a whole like most of the developing world is rich in Indigenous genetic resources. The author observed that, the agriculture system got improved by the adaptation of new technology but adequate recognition of rights of farming community is lacking. Most of the rural populations are denied of their rights to land or property, water, labor and access to markets, education, information and new technologies. Traditional plant varieties and wild species are disappearing irreversibly due to the flaw of monoculture farming and use of new technologies like biotechnology and the process has resulted in the disappearance of farming know-how.