Agriculture was the mainstay of the people of Punjab. It was therefore necessary for the British to develop it by making it less dependent on the caprice of nature. After annexation of the Punjab, the British paid attention towards development of the resources of land in the province by means of improved methods of irrigation and channels of communication. The province of Punjab was divided between the areas known as doabs. The area between the rivers satluj and the Beas was called Bist Jalandhar Doab, and between the Chenab and Jhelam was called Chaj Doab, most parts of the areas between the rivers Ravi and Chenab called the Rachna Doab and upper portions of the area between the rivers Beas and Ravi called Bari Doab and between the rivers Jhelam and Indus was called the Sind Sagar Doab.\(^1\)

From the point of view of irrigation, the plains of the Punjab had two types of land. One irrigated by inundation from rivers and small streams and the other by artificial means of irrigation such as wells and canals. The former included the river valleys called bet or khadir or hither which were several miles wide along the river banks. The uplands were generally known as bar or bangar area that lay between the river valley and formed the vast doabs. Bar was a vernacular term used for the lower portions of the Bari, Rachna and Chaj doabs. These areas were generally arid and largely uncultivated before the advent of the canal colonies. These bars were locally known by different names like the Ganji Bar and Nili Bar in the Bari Doab, Sandal Bar in the Rachna Doab and Kirana Bar in the Chaj Doab.\(^2\)

\(^1\) Revenue and Agricultural Department (Agriculture Branch), October 1883, N.A.I., New Delhi.

\(^2\) Revenue and Agriculture Department (Land Revenue Branch), September 1897, Proceeding No. 60, N.A.I., New Delhi.
EARLY EXPERIMENTS IN AGRICULTURE

The British introduced several policies in the Punjab for the development of agriculture. The Board of Administration sanctioned advances of money for the repair of old wells, for the sinking of new ones and for the excavation of water courses.\(^3\) The Agri-Horticulture Society of Punjab (working model in operation in 1851), contributed a lot by making people aware of new methods of agriculture, based on scientific lines and by introducing new and improved varieties of seeds. The digging of canals and reclamation of lands started throughout the province.

The agrarian policies followed by the British in the Punjab, after annexation in 1849, aimed on pacification of the people of the province. The Governor General Lord Dalhousie instructed the Board of Administration to win the goodwill of the people for British rule. The Government officials were responsible for making the people of Punjab feel comfortable under the British rule and no official was allowed to torture or misbehave with the public. Firm action was taken against the government officials who were found guilty. In a letter dated 19\(^{th}\) March 1856, R. Temple, Secretary to the Chief Commissioner of Punjab, wrote to the Under Secretary to Government of India (Foreign Department) that there were complaints of misconduct of kardar (Revenue Collector) of Subzulkote (an area under Bahawalpur) and they requested the Nawab of Bahawalpur to remove the kardar.\(^4\) It is an example of earlier efforts by British Government to lay a strong foundation of British empire in the Punjab by winning the goodwill of the people of Punjab.

The British were keen to develop the agriculture of Punjab on scientific lines. “It was observed by the government that by judicious measures, the agricultural produce of the Punjab may be increased in quantity and improved in quality to the immediate benefit of the people of Punjab and ultimate benefit of the British Government. The technological advancement played significant role in the promotion

\(^3\) Foreign Department (Revenue-A Branch), June 1864, Proceedings No. 22, N.A.I., New Delhi.

\(^4\) Foreign Department (Political Branch), 28 March 1856, Proceeding No.250, N.A.I., New Delhi.
of agriculture. The introduction of iron implements was an important feature of agriculture in the second half of nineteenth century. Some important new iron implements were sugarcane crushers, Persian wheels, ploughs with iron blades, fodder cutters, harrows and drills. The improved Persian wheel was designed in AD 1850 and it worked to increase the water flow. It required less human and cattle labour. The iron vessels called *tinds ad dols* on the Persian wheel gained popularity.” They began to be made in large quantities in the cities and towns throughout the province. In November 1863, an exhibition was held in Lahore in which agricultural and horticultural implements were also stalled.  

The British had started their efforts to make people aware of new technological equipments.

The Agri-Horticulture Society had its working model in operation at Lahore by December 1851.  

The cultivation of tea was introduced in the Himalyan Valleys to meet the requirements of the Indian and European markets and successful experiments were made in the Kangra district. This was the most successful of all British attempts to introduce new staples. In 1848, two tea plantations were established in the Kangra valley. In 1852, the Governor-General, Lord Dalhousie, visited Dharamshala and encouraged furtherance of this experiment. Accordingly, a third plantation named Holta was started in 1852. In 1861, with the exception of government plantation at Holta and Nagrota, there was hardly an acre under tea cultivation but by the year 1865, the tea plantation extended through the Kangra and Palam valley and reached as far as Kullu. The following table shows number of tea estates in the Kangra district during the year 1865 :-

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5. *Home Department (Public Branch), June 26, 1864*, Proceeding No. 12, N.A.I., New Delhi.

Table 3.1: Number of tea estates in the Kangra district during the year 1865

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Locality</th>
<th>Name of owner / Manager</th>
<th>Extent of estate in acres</th>
<th>No. of acres planted in 1865</th>
<th>No. of acres prepared for planting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Shahpur &amp; its vicinity</td>
<td>Col. Brunett</td>
<td>250</td>
<td>76</td>
<td>-</td>
</tr>
<tr>
<td>2.</td>
<td>Dharamshala</td>
<td>Captain White</td>
<td>162</td>
<td>50</td>
<td>-</td>
</tr>
<tr>
<td>3.</td>
<td>Kunyarah (near Dharamshala)</td>
<td>Mr. Shaw</td>
<td>340</td>
<td>120</td>
<td>40</td>
</tr>
<tr>
<td>4.</td>
<td>Gopalpore and adjacent villages (between Dharamshala and Holta)</td>
<td>Kangra Valley Tea Co.</td>
<td>557</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5.</td>
<td>Kusmal (near Holta)</td>
<td>Mr. Mckay</td>
<td>200</td>
<td>150</td>
<td>50</td>
</tr>
<tr>
<td>6.</td>
<td>Kusmal (near Holta)</td>
<td>Captain Batt</td>
<td>700</td>
<td>150</td>
<td>100</td>
</tr>
<tr>
<td>7.</td>
<td>Bandlah (near Holta)</td>
<td>Captain Duff</td>
<td>1075</td>
<td>200</td>
<td>50</td>
</tr>
<tr>
<td>8.</td>
<td>Bandlah (near Holta)</td>
<td>Kangra Valley Tea Co.</td>
<td>320</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>9.</td>
<td>Holta</td>
<td>Nassau Tea Co.</td>
<td>2960</td>
<td>416</td>
<td>-</td>
</tr>
<tr>
<td>10.</td>
<td>Holta</td>
<td>Mr. Conlan</td>
<td>57</td>
<td>10</td>
<td>-</td>
</tr>
<tr>
<td>11.</td>
<td>Lanod (near Holta)</td>
<td>Dr. Crawford</td>
<td>700</td>
<td>60</td>
<td>-</td>
</tr>
<tr>
<td>12.</td>
<td>Bijnath and other villages</td>
<td>Captain Fitzgerald</td>
<td>1120</td>
<td>200</td>
<td>20</td>
</tr>
<tr>
<td>13.</td>
<td>Dewal</td>
<td>Mr. Blewitt</td>
<td>198</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>14.</td>
<td>Dewal</td>
<td>Mr. Gordon</td>
<td>389</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>15.</td>
<td>Sunsal and other villages</td>
<td>Dr. Crawford</td>
<td>495</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>16.</td>
<td>Kullu Valley</td>
<td>Mr. Knox</td>
<td>700</td>
<td>400</td>
<td>250</td>
</tr>
<tr>
<td>17.</td>
<td>Kullu Valley</td>
<td>Kullu Valley Tea Co.</td>
<td>264</td>
<td>23</td>
<td>13</td>
</tr>
</tbody>
</table>

Source: - *Foreign Department (Revenue-A), February 1865, No.84-85, N.A.I., New Delhi.*

Most of these estates were grouped in the vicinity of mother plantation at Holta.

**CULTIVATION OF GRAM, VEGETABLES, PULSES AND GRAIN**

In 1871, Department of Revenue came to be designated as Department of Agriculture. The British introduced experiments in the farming sector. Experimental sowing of the French gram was introduced in Punjab during the year 1877-1878. The
seed received was divided between, the Deputy Commissioners of Hoshiarpur and Lahore districts and the Conservator of Forests. The season of 1877-78 remained very unfavourable for the ordinary gram of the country. In most places the yield was poor and in many the crop was destroyed entirely by the unseasonable rain and severe frost during the winter. The experiments with white French gram also suffered from same causes. It was handled as the ordinary gram was treated, no manure was applied for the crop and very little water was given, but the plants appeared to require higher cultivation and more frequent irrigations to keep them in good condition than the indigenous variety.8

British made it clear that in the management of the so-called “model” farms, undue stress should not be laid on financial results, because it was to be kept in consideration that the failures might occur during experiments. It was also made clear that the model farms should be purely experimental in character, no portion of the area being necessarily managed with the sole object of obtaining the net profit on the outlay. It was suggested therefore, that the government farms should be termed “experimental” and not “model” farms. It was recommended that while conducting experiments, selection of a site, character of the soil and agriculture of the province should be carefully measured. To make the reports valuable, emphasis was laid on punctuality of their sense and communication to officials and agriculturists interested in them.9

The experiments for the cultivation of champion potato were made in the year 1882.10 To actuate experimental cultivation, many experimental farms were laid out. An experimental farm of 55 acres was set up at Lyallpur in the Chenab Colony in the year 1901. A seed farm was established on five hundred acres of land in the Jhelum colony. Soon the work done by central and provincial government in the field of research and education and it started yielding good results.

The year 1881-82 may rightly be described as an important landmark in the development of wheat trade in India. The Punjab wheat trade assumed a position of

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8 Revenue & Agriculture Department (Agriculture Branch) December 1879, Proceeding No.2, Part B, N.A.I., New Delhi.
9 Revenue and Agriculture Department, April 1884, Proceedings, No.56, N.A.I., New Delhi.
10 Revenue & Agriculture Department (Agriculture Branch), January 1883, Proceedings No.36, N.A.I., New Delhi.
importance in 1881-82 and it continued throughout the 1880’s.\(^{11}\) By the year 1883, the Punjab had seven million acres under wheat cultivation and the yield was equal to that of the United Kingdom. Earlier, in 1881-82, the Punjab wheat was exported to France via Sind which amounted to six million Quintals and valued at Rs. 30,33,961.\(^{12}\)

Government also issued instructions to enhance the quality of wheat. On 22\(^{nd}\) August 1883, J.E. Reid, Officiating Secretary to Government, North-Western Provinces and Oudh wrote to all Commissioners of Divisions North-West Provinces and Oudh that the wheat should be sown unmixed with other grains, and that every care should be taken to prevent admixture of dirt, other grains or foreign substances of any kind, as, owing to neglect to observe these precautions, Indian wheat failed to obtain as high a price in the London market as it otherwise would.\(^{13}\)

There had been fluctuations in the wheat price in Punjab. The total area of crop in 1880-81 was 21,998,379 acres and in 1892-93 it increased to 26,732,864 acres or 21.5 percent. But in several intermediate years, the area had fallen a good deal below that of 1880-81. The fact was that so large a proportion of cultivated land of Punjab was entirely dependent on rainfall for success of its crops and due to this the violent fluctuations occurred year after year.\(^{14}\)

It was anticipated in January 1880 that the Indus Valley Railway would have an important effect on the future of wheat trade. The export of wheat in the earlier years (1874-75 to 1877-78) from the Punjab Via the Indus route remained as following:

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11 Revenue and Agriculture Department (Agriculture Branch), December 1895, Proceeding No. 7, N.A.I., New Delhi.

12 Home Department, (Municipalities Branch), April 1883, Proceeding No. 11, N.A.I., New Delhi.

13 Revenue & Agriculture Department (Agriculture Branch), Feb 1884, Proceeding No.3, N.A.I., New Delhi.

14 Revenue & Agriculture Department (Agriculture Branch), December 1895, Proceeding No.7, N.A.I., New Delhi.
Agriculture and Development of Canal Colonies

<table>
<thead>
<tr>
<th>Year</th>
<th>Maunds</th>
</tr>
</thead>
<tbody>
<tr>
<td>1874-75</td>
<td>303, 911</td>
</tr>
<tr>
<td>1875-76</td>
<td>423, 853</td>
</tr>
<tr>
<td>1876-77</td>
<td>595, 153</td>
</tr>
<tr>
<td>1877-78</td>
<td>1, 305, 675</td>
</tr>
</tbody>
</table>

Source: Revenue and Agriculture Department, (Home), January 1880, (Agri-Horti), Proceeding No.62, N.A.I., New Delhi.

The large exports in the summer of 1877, both across the North-Western Provinces and toward Sind, were due to the famine in Bombay, but the export received a check in the last quarter of 1877, owing to the failure of the autumn harvest in the Punjab and the rise in prices. In 1878 the export toward Karachi rose again until it reached 361,528 maunds in the quarter ending 30th September 1878. In 1880, the average sale price of wheat in an ordinary year was assumed at Rs. 1-9 per maund. In 1880 the statistics of wheat irrigation in Punjab in an average year was as under:

| Wheat irrigated from wells | 1,600,000 |
| Wheat irrigated from canals | 381, 557 |
| Wheat irrigated from other works not under the canal department | 426, 000 |
| Wheat unirrigated from other works not under canal department | 4,262,443 |
| Total | 6,670,000 |

Source: Revenue and Agriculture Department, (Home), January 1880, (Agri-Horti), Proceeding No.62, N.A.I., New Delhi.

There was huge area of wasteland in the Punjab and the government deemed it fit to bring it under plough. Only in Multan and Derajat Divisions alone the waste land exceeded seven million acres.

<table>
<thead>
<tr>
<th>Area</th>
<th>Total Acres</th>
<th>Cultivated Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multan division</td>
<td>6,722,220</td>
<td>45,171</td>
</tr>
<tr>
<td>Derajat division</td>
<td>997,346</td>
<td>3,886</td>
</tr>
<tr>
<td>Grand Total</td>
<td>7,719,566</td>
<td>49,054</td>
</tr>
</tbody>
</table>

Source: Revenue and Agriculture Department, (Home), January 1880, (Agri-Horti), Proceeding No.62, N.A.I., New Delhi.

During January 1880 the proposed projects were the Sirsa, Lower Bari Doab and the Chenab canals, estimated to irrigate one million acres for the spring crop and the Sidhnai, Chiniot and Ramnagar inundation canals would also give wheat waterings. At that time only two canals were under construction, the Sirhind canal and the Swat canal;
the total area to be irrigated by the first was 783,000 acres and by the second 1,20,000 acres.¹⁵

**VARIOUS ACTS PASSED BY THE BRITISH TO IMPROVE AGRICULTURE IN THE PUNJAB**

The British wanted economically strong village communities based on broad and prosperous group of peasant proprietors and tenants. To promote the agricultural development in Punjab, they passed several acts from time to time. In 1862, the Penal Code was introduced in Punjab. The Punjab Laws Act IV of 1872 stepped in and gave the power to the courts to over rule customs wherever necessary. On March 17, 1873 the control of experimental farms in the Punjab was transferred from the Government of India to the Government of Punjab. For the improvement of the cattle wealth, the Veterinary College of the Punjab was established in Lahore in 1882. Under the Land Improvement Loans Act of 1883, long term loans for making permanent improvements on land were given. The Agriculturist Loan Act XII of 1884 provided for short term loans for the purchase of seed, cattle, manure ad implements. The Land Revenue and Tenancy Acts were passed in the year 1887.¹⁶ While granting land in Chenab Canal Colony, it was made compulsory that the occupancy rights, under section 8 of Act XVII of 1887, were to be granted to colonists who after five years from the date of allotment found to have fulfilled the conditions of his grant regarding personal residence, the bringing of his land under cultivation and the punctual payment of the Government demand.

**THE SYSTEM OF CULTIVATION IN THE PUNJAB**

The system of cultivation in the Punjab consisted of two harvests: spring harvest and autumn harvest, vernacularly known as *rabi* and *kharif* respectively. “The spring crops were sown from October to November and harvested from April to June. The *kharif* crops were sown from June to August and harvested from September to December. The important crops grown in the spring harvest were wheat, barley, pulses, oilseeds,

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¹⁵ Revenue and Agriculture Department, (Home Branch), January 1880, (Agri-Horti), Proceeding No.62, N.A.I., New Delhi.

¹⁶ Department of Revenue and Agriculture, (Land Revenue Branch), September 1897, Proceeding No. 60, N.A.I., New Delhi.
vegetables and sugarcane. The main autumn crops were millets, maize, rice, cotton and hemp. Wheat was the principal crop of the spring harvest and the millets of the autumn harvest. Rice was cultivated primarily in Kangra, Ambala, Hoshiarpur, Gurdaspur and Sialkot districts. Cotton and sugarcane were grown generally all over the plains. Cotton was produced largely in Delhi and Hissar divisions, and sugarcane in the districts of Jalandhar, Hoshiarpur, Gurdaspur, Sialkot and Delhi. The chief poppy growing districts were Ambala, Shahpur and Kangra. Tobacco was produced in the Central and Western Punjab. The cultivation of indigo was confined to districts of Multan, Muzaffagarh and Dera Ghazi Khan.Important cash crops were sugarcane, cotton, indigo, oil seeds, drugs and spices. The crops like wheat and sugarcane had numerous varieties.

To retain the arability of soil, the land was left fallow for one harvest or the whole year. The value of fallow ploughing was fully understood and generally, the fallow land used to be turned over with the help of plough as often as the cultivator could manage it. Many agricultural operations like ploughing, sowing, harrowing, fencing, weeding, watering, reaping, threshing and winnowing were carried out by the people keeping in view the land and its resources. Field was ploughed chiefly with the help of wooden plough. Manure was mostly applied in the case of chahi or irrigated land. Land irrigated by wells was always manured and was kept constantly under crop. Crops such as sugarcane, maize, tobacco and vegetables were especially manured. The agricultural land in the Punjab contained alluvial soil. It was noticed in Karachi district that the manure was not used and the wheat was grown year after year on the same land but the annual deposit of silt in a great measure neutralized the mischief of this.

After preparing the seed bed by ploughing, the next operations were connected with sowing and manuring the crops. Three methods of sowing were commonly employed in the Punjab: chhatta, kera and pora. Scattering the seed on the surface was called chhatta. Dropping the seed into the furrow by hand by a person other than the

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ploughman called, *kera*. Drilling through the tube attached to the plough handle was called *pora*.

The last method if skillfully used, deposited the seed into the bottom of the furrow and was employed when the surface was dry.

There were some other operations and technology connected with sugarcane cultivation. The whole stalk of sugarcane was cut in the field and then brought into the work area, where the leaves were removed and dried for fuel used in the boiling of the liquid extracted from the cane by the sugarcane mill. The *belna* (sugarcane press) erected by the carpenter consisted of two wooden rollers. The cane juice was extracted by feeding cane between the rollers as they were turned by a yoke of bullocks. The boiling of the juice differed according to the article required. The cultivators made either *gur* (jaggery) *shakkar* (unrefined sugar) and *mal-rab*. For making *gur* and *shakkar* the boiling process was the same. In making the *mal-rab*, the cane juice was not boiled so much as for *gur* and *shakkar*.

The irrigation by wells was confined to the plain country, particularly, where the water level was near the surface. The bist-Jalandhar Doab, Upper Bari Doab and the Rachna Doab had more wells than other regions. The wells were of two kinds *pakka* (masonry) and *kachcha* (unbricked). Of these, the masonry wells were more important. The apparatus used for lifting the water was known as Persian wheel. Large wells were worked with two Persian wheels and were known as *do-hatra*. The *kachcha* wells, on the other hand were in frequent use in the river areas where the water level was high. They were usually dug in the earth without masonry wells and worked well where the clay was strong while in sandy soils they soon fell in. Irrigation by these wells was familiar in the *bet* areas and the upper Sutlej-Jamuna Divide. Wherever the irrigation was unsuitable by the wells or inundation canals, the people were encouraged to make tanks and embankments for the purpose of irrigation.

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20 *The Imperial Gazetteer of India, Vol. XX, op.cit*, pp. 296-297.
21 *Revenue and Agricultural Department (Agriculture Branch)*, June 1891, proceeding No. 7, N.A.I., New Delhi.
23 *Foreign Department (Revenue-A Branch), June 1864*, Proceeding No.22, N.A.I., New Delhi.
It was noticed in Amritsar district that the sub soil saturation by filtration of canal water led to rise in water level and made well irrigation easier throughout most of the district.\(^\text{24}\) The British adopted the policy to provide canal water to few selected areas by the opening of new distributaries but the policy of Irrigation Department in making these extensions was only to give monsoon supply for the *kharif* harvest and so allow the more valuable crops such as rice and cane to be raised in larger quantities.

British government was concerned about utilizing water in an efficient manner and remarked that the people at North-West Front use water imperfectly and had no idea of economizing it.\(^\text{25}\) Lt. Col. J. Crofton, R. E., Under Secretary to the Government of Punjab, in the Public Works Department, Irrigation Branch wrote to the Secretary to the Government of India Public Works Department that the rice was the most wasteful of all the cultivations in the quantity of water it absorbs, more especially where the soil was sandy.\(^\text{26}\) The government wanted that the people should use water carefully when they know its dirth in their area.

**DEVELOPMENT OF CANAL COLONIES**

During the period of this study (1849-1901), the Punjab plains with the exception of the Salt Range Tract, presented almost one vast leveled unbroken territory. These were eroded channels within which the great rivers ever shifted their beds. The low hills of chiniot and Kirana in Jhang district and the narrow submontane zone covering parts of the districts of Ambala, Hoshiarpur, Gurdaspur, Sialkot and Gujrat broke the uniformity of the surface of the land.\(^\text{27}\) The slope of the Punjab plains was generally south-westwards. In the tract across the salt range and along the Indus the slope was more westwards. It also depended on the nature and direction of the hills in the area. The general height of the Punjab plains above the sea level was rarely over 1000 feet. The lowest contour ran in two branches in northern and southern directions. The combined

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\(^{26}\) Ibid.

result of these two slopes was a fall in a south-westernly direction at right angles to the mountain ranges and parallel with the general course of the rivers. The fall was exceedingly gentle, the average being two or three feet per mile. The early British administrators and engineers found the Punjab eminently suited for canal irrigation. Being intersected by great rivers and large number of rivulets and enriched with general southwards slope of the surface, the canalization was possible on a large scale.

The phenomenon of agricultural colonization in the Punjab was an amalgam of twin processes of canalization and colonization. The official policy with regard to canal irrigation and colonization turned a new leaf in the agricultural history of the Punjab. Due to indefinite and varied character of land tenures prior to the annexation of the British, it became essential to identity the lawful claimants who claimed rights to the soil and to maintain a record, indicating the persons who were liable to pay the land revenue which had to be paid in the form of fixed cash assessments independently of the character of the harvests. While recognizing the landed rights through legislation, the early administrators had to keep in mind the complex nature of the agrarian society of Punjab. Widespread prevalence of double ownership-superior and inferior proprietors was one of the distinguished characteristics of land ownership in Punjab.

In 1880s, the government turned its attention towards the western plains and realized the need of making optimum utilization of its dry and arid lands thinly inhabited by semi-nomadic people. The prospects of agricultural growth were found promising in the said area. As such, the colonial masters diverted their effort and energy to embark upon an extensive irrigation system in order to improve the quality of land in the grandiose project to laying down a number of irrigational canals. They all aimed at colonizing large tracts of uplands of Chaj, Rachna and Bari Doab area. In all, an area of ten million acres could be colonized by the work of canalization.

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28 The Imperial Gazetteer of India, Vol. XX, pp. 246-247.
29 Foreign Department (Secret Branch), 28 April 1848, No. 61, N.A.I., New Delhi.
31 Department of Revenue and Agriculture, (Land Revenue Branch), September 1897, Proceeding No. 59, N.A.I., New Delhi.
The individual interests in land namely classified as superior proprietors, proprietors in possession, hereditary cultivators and tenants-at-will were defined. Much less weightage was accorded to the superior proprietors. It was fully realized that land should be maintained in the hands of those whose hereditary occupation was tillage. Rights of proprietors in possession were respected and those of non-proprietary cultivators were protected. Occupancy rights were conferred on tenants of long term standing. Tenancy Act first enacted in 1868 and then in 1887 respectively regulated the terms of tenancy. Tenants-at-will could be ejected through the notice of the court.

The colonial policy of the government may be divided into three phases. (i) In the first phase the object of the government in the colonization of the western plains was to reduce the pressure of population in the highly congested districts of the province where the agricultural population had already reached or was fast approaching the limit which the land available for agriculture could support. (ii) The second phase was designed to create villages of superior type. Thus, the yeomen and capitalists who would constitute healthy agricultural community appeared on the scene. (iii) In the third phase, the government intended to combine the requirements of the army and allotted land for the camel, mule and select cattle breeding and plantations.

Canal irrigation was more significant in the south-western Punjab than in the north-eastern Punjab. These canals were of two types: perennial and inundation. The perennial canals worked almost throughout the year and were managed by the state. Irrigation from them concentrated in the Upper Bari and Rachna Doabs. In the early 19th century, the Hansli Canal and the Western-Jamuna Canal were perennial canals. Bulk of the canals, however, were inundation canals, which worked only during the rainy season when the water in the rivers was sufficient to enter into it. These canals took their supply from the Sutlej, Ravi, Chenab, and Indus rivers. They might be classified in Multan, Derajat and Shahpur canals. In construction, these canals were simple and worked for some months only.

33 *Department of Revenue and Agriculture, (Land Revenue Branch), September 1897*, Proceeding No. 60, N.A.I., New Delhi.
34 *Public Works Department, (Irrigation Branch), March 1867*, No. 47, N.A.I., New Delhi.
In the year 1862-63, the British Government said that the income from the canals was not very much attractive because much had been laid out on their construction and repair. The results of Jumna and the inundation canals were considered satisfactory, whereas, the Bari Doab canal gave poor return, not even one lakh rupees for the whole year.\(^{35}\) The British encouraged inundation canals because outlay on them was usually small and the return was high.

The Punjab also had some minor canal colonies. The first minor successful attempt for the colonization of the crown waste lands in the Punjab was made with the construction of Sidhnai Canal. It had its head on the Ravi in the Multan district and irrigated a considerable area at the western extremity of the Ravi-Satluj watershed.\(^{36}\) The Sidhnai system consisted of four canals, the Sidhnai Canal proper and three small independent channels: Koranga, Fazal Shah and Abdul Hakim. (For more information regarding Sidhnai Canal see appendix IX and X).

The first work in the eastern plains in the early years of the British rule was the construction of the Upper Bari Doab Canal from a branch of river Ravi at Madhopur. The original project of the canal was drawn up in 1850. In 1860-61 it irrigated an area of 89,756 acres.\(^{37}\)

The development of the canal colonies was one of the most impressive projects which the British Government had undertaken in Punjab to increase the agricultural output and to create a loyal political base for the British. They gave foremost priority to the agricultural sector and set aside the largest share in the total capital investment in public sector for agricultural and irrigational projects. The British gave land grants to those who remained loyal to them. Particularly in Punjab, the land grants were given to those who helped the British in suppressing the revolt of 1857. The land grants were also given to those who had served in the British Army. Some Crown lands were auctioned to the highest bidders. During the initial phase of British rule, the expansion of canal

\(^{35}\) Foreign Department (Revenue-A Branch), June 1864, Proceeding No. 22, N.A.I., New Delhi.


\(^{37}\) Public Works Department (Irrigation Branch) July 1868, Proceeding No. 1-A, N.A.I., New Delhi.
irrigation was considered most important among the works for the development of the resources of the Punjab. The British Government made continuous efforts to increase land revenue and cesses. Later on, even the Crown Waste Land was given on harvest leases for cultivation.

The original plan of the Bari Doab Canal was based on an average volume of 3,000 cubic feet per second. But in fact, the average minimum in the cold season, on the measurement of 10 years, was found to be only 1850 cubic feet per second, and in the three years 1865 to 1867, the mean hardly exceeded 1400 cubic feet per second. In Amritsar division, the extension of the Bari Doab Canal enhanced value of the land. Earlier, the settlement had little value, and in order to retain the cultivators on it, the owners were willing to allow them any tenure which they chose to claim; hence considerable numbers were entered in the records as they paid a fair rent. Land then paid little or no rent, and the question to the proprietor had no practical significance. But in the improved state of things, the proprietors were keenly alive to the encroachments which were made on their rights.

Sirhind Canal was constructed to irrigate the tract between the rivers Satluj and Ghaggar. During the proposal of the Sirhind canal, Hammer (the Executive Engineer of the Main Line Division) suggested to raise the floorings of the head and weir sluices by 2 or 3 feet to improve not only the canal channel but also to reduce the impact of floods at the tail of the weir sluices and his suggestion was immediately accepted by Lieutenant Colonel H.A. Brownlow (Officiating Inspector General of Irrigation on the works in the Main Line Division of the Sirhind canal). The work of its construction began in 1876 and irrigation started from 1885.

The Swat River Canal was constructed to irrigate the plains lying between Swat and Kabul rivers. The Swat River Canal was sanctioned as a protective work but it proved a highly remunerative work for the British Government. The protective irrigation

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38 Department of Revenue and Agriculture, (Land Revenue Branch), September 1897, Proceeding No. 59, N.A.I., New Delhi.

39 Public Works Department, July 1868, (Irrigation-A Branch) Proceeding No. 45, N.A.I., New Delhi.

40 Public Works Department (Civil Works-Irrigation Branch), Proceedings No. 9, N.A.I., New Delhi.
works were those that were sanctioned in consideration of their value as famine protective works but without any expectation of their becoming directly remunerative. The fund for their construction was provided from the famine grant. There were following five of these works in operation in the year 1901 in India:

<table>
<thead>
<tr>
<th>Name of work</th>
<th>Province</th>
<th>Area irrigated in 1899-1900</th>
<th>Capital outlay to end of 1899-1900</th>
<th>Net revenue in 1899-1900</th>
<th>Return on capital outlay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swat River Canal</td>
<td>Punjab</td>
<td>158,106</td>
<td>41,29,684</td>
<td>3,95,393</td>
<td>9.57</td>
</tr>
<tr>
<td>Betwa Canal</td>
<td>North-Western Provinces</td>
<td>36,322</td>
<td>43,74,320</td>
<td>8,847</td>
<td>-----</td>
</tr>
<tr>
<td>Rushikulya Project</td>
<td>Madras</td>
<td>81,794</td>
<td>47,46,149</td>
<td>42,075</td>
<td>0.89</td>
</tr>
<tr>
<td>Mhaswad Tank</td>
<td>Bombay</td>
<td>13,656</td>
<td>20,75,411</td>
<td>13,216</td>
<td>0.64</td>
</tr>
<tr>
<td>Nira Canal</td>
<td>Bombay</td>
<td>27,200</td>
<td>56,83,300</td>
<td>84,832</td>
<td>1.49</td>
</tr>
<tr>
<td>Total 1899-1900</td>
<td></td>
<td>317,378</td>
<td>2,10,08,864</td>
<td>5,26,669</td>
<td>2.51</td>
</tr>
<tr>
<td>Total 1898-1900</td>
<td></td>
<td>302,245</td>
<td>2,07,87,660</td>
<td>4,77,230</td>
<td>2.30</td>
</tr>
<tr>
<td>Total 1898-1899</td>
<td></td>
<td>308,575</td>
<td>2,06,87,255</td>
<td>3,98,335</td>
<td>1.92</td>
</tr>
</tbody>
</table>

Source: *Department of Revenue and Agriculture, August 1901, Proceeding No. 53, Part-B, N.A.I., New Delhi.*

The remaining works except Swat canal never proved remunerative and the Betwa seldom paid even its working expenses.

In the year 1865, for the excavation of the Western Jamuna Canal, an estimate for the sanction was submitted for Rs. 97,359 but in 1867 a revised estimate was submitted and the estimated amount exceeded by Rs. 63,000. This was partly due to the increased length and partly to an alteration in rates. The compensation for land alone accounted for Rs. 11,000 out of this.

Three projects—the Sidhnai canal from the Ravi, the Lower Sohag and Para Canal form the Satluj and Ram Nagar Canal, afterward known as the Chenab Canal from the Chenab were drawn up in 1882. In a letter dated 15th November 1883, the Secretary of

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41 *Department of Revenue and Agriculture, August 1901, Proceeding No. 53, Part-B, N.A.I., New Delhi.*

42 *Public Works Department (Irrigation Branch), August 1867, Proceeding No. 24-A, N.A.I., New Delhi.*
State for India wrote to the Government of India for sanction the project of Chenab Canal, an estimated cost of Rs. 30,59,474. During the submission of the Chenab Canal project, the map and plans connected with the project were also to be submitted. Government of India asked in a latter dated 7th January 1884 from the Secretaries of the Governments of Madras, Bombay, Bengal, North-West Provinces and Oudh, and the Punjab, (Public Works Department) to furnish the map showing position of main and principal distributary channels, longitudinal section showing scope of main canal and transverse sections of main canal at head and plans showing principal dimensions of the more important works, on main canal only.

The experiment of Chenab Colony proved very successful. Before colonisation, this area was a desolate waste land covered mostly with scrub forest. The aboriginal tribes were hostile and opposed to colonisation. These difficulties were overcome by the indomitable and adventurous spirit of the people of Punjab. The Chenab Colony showed a marvelous development. The area of Lyallpur district which was backward and desolate region in the Punjab in 1891 became the model of Punjab agriculture in 1901.

In the western Punjab, owing to the insufficiency of rainfall, agriculture was far more dependent on irrigation, and traditional irrigation system relied on the wells and seasonal inundation, allowing cultivation only in tracts contiguous to rivers. The Upper Sohag Canal was taken over by the irrigation department in 1855. The Lower Sohag Canal was improved, remodeled and opened in 1885-86. The Lower Sutlej inundation canals were an imperial system of inundation canal in the Punjab, taking off from the right bank of the Sutlej and irrigating a part of Multan district. Earlier, in 1850, Lieutenant Anderson of the Bengal Engineers was appointed superintendent of these canals. His duties were to enlarge, improve, alter or strengthen the works constructed previously. Their aggregate length was 600 miles.

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43 Public Works Department, Civil Works (Irrigation Branch) July 1884, Proceeding No. 51, N.A.I., New Delhi.
44 Public Works Department, Civil Works (Irrigation Branch) July 1884, Proceeding No. 53, N.A.I., New Delhi.
45 Department of Revenue and Agriculture (Land Revenue Branch), September 1897, Proceeding No. 59, N.A.I., New Delhi.
The British undertook the repair and improvement of the already existing canals in Derajat and Multan. The British Government encouraged the sinking of wells by granting takavi loans on easy terms for such purpose. The numbers of wells at the time of annexation was 1,36,638 and out of 93,75,983 acres of the total crops irrigated during the year 1900, about 41,54,498 acres were irrigated by wells.\footnote{Circular Orders Issued by the Board of Administration in the Revenue Department During the Years 1849 to 1853, op.cit, pp. 53-54}

The Muzaffargarh district which was surrounded from the three sides by the rivers had an efficient system of inundation canals known as the Muzaffargarh Inundation Canals which took their supplies from the left bank of the Indus and the right bank of the Chenab. The area irrigated by Muzaffargarh Inundation Canals was 306,658 acres in 1889-90 and 316,451 acres in 1900-1901.\footnote{P.A.R. 1889-90, p.143.}

Due attention was paid to the project of Rechna Doab, because it was the absolute necessity as only irrigation could prevent the state from the awful visitations of famine. The greater part of the Rachna Doab was a desolate region before the introduction of this canal. \footnote{Public Works Department, (Irrigation Branch), March 1867, Proceeding No.47-A, N.A.I., New Delhi.} In giving priority to the Chenab over the Jhelum, the government acted upon business principles. Most of the government waste land was also in the Rechna Doab.

The Oriental Canal and Irrigation Company was formed in London and they offered the government to work in collaboration and to establish a joint stock company for Rachna Doab project but their offer was rejected because the employment of a private company was not considered suitable by the government.\footnote{Public Works Department, (Irrigation Branch), March 1867, Proceeding No.50-A, N.A.I., New Delhi.}

The Shahpur Inundation Canals system fed from the Jhelum river and mainly situated in Shahpur district. The area irrigated by Shahpur Inundation Canals was 18,535 acres in 1889-90.\footnote{Imperial Gazetteer of India: Provincial Series, Vol. I, op.cit, p.212; P.A.R. 1889-90, p. 143.} The eastern plains had relatively small number of inundation canals. Of these, the Grey canals in the Ferozepur district and the Ghaggar Canals were most
Agriculture and Development of Canal Colonies

important. The well known Grey Canals owed their origin to Captain L.J. Grey who got constructed a large number of canals between 1874 and 1884.\textsuperscript{52}

“The canals practically constituted the life-blood of agriculture in the Punjab. Being intersected by great rivers and countless rivulets and enriched with the generally smooth southward slope of the surface, the Punjab plains were eminently suited for canals.” The Sidhnai colony located in Multan district was an important project. It settled mainly in 1886-1888 and he total allotted area, after further extensions in the 1890’s was around 2,50,000 acres. The Sidhnai canal irrigated an area of about 185,709 acres in 1897-98 but during the year 1899-1900 there was short supply of water in the rivers especially in Jumna, Sutlej and Ravi and the project worst hit by this shortage of supply of water was Sidhnai canal. It could irrigate only 26,265 acres in 1899-1900.\textsuperscript{53} The British Government gave explanation that the water was available for only 117 days in the year as compared with an average 245 days during the previous ten years.

“The Sohag Para Colony situated in the Montgomery district was also settled in 1886-88 with an allotted area of 86,300 acres. The Chunian Colony situated in Lahore district was also a significant project. It had an allotted area of 102,500 acres and the settlement took place in 1896-1898 and 1904-1906.”\textsuperscript{54}

Besides constructing major perennial canals, the government took a keen interest in management of inundation canals. They consisted almost entirely of old works which were repaired, restored and extended by the government. These canals chiefly existed in Dera Ghazi Khan, Multan, Ferozepur and Montgomery districts. These were taken from the Sutlej, Ravi, Chenab, Jhelum, Indus and Ghaggar rivers. Most of these canals contributed greatly to the raising and maturing of the \textit{kharif} crops. There were three main branches of the Lower Chenab canal: Rakh, Jhang and Gugera.\textsuperscript{55} The Lower Chenab

\textsuperscript{52} District Gazetteer Ferozepur 1883-84, p.9. (Hereafter D.G.).

\textsuperscript{53} Department of Revenue and Agriculture (Land Revenue Branch), August 1901, Proceeding No. 53, Part-B, N.A.I., New Delhi.

\textsuperscript{54} Imran Ali, \textit{op.cit}, pp. 14-18

\textsuperscript{55} Department of Revenue and Agriculture, (Land Revenue Branch), September 1897, Proceeding No. 59, N.A.I., New Delhi.
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canal was an important perennial canal. This canal was considered as the most extensive and successful irrigation system in India.

The Punjab had a large number of inundation canals. The canals taken from the Satluj were divided into the upper and lower Satluj canals. The upper Satluj series irrigated the districts of Lahore and Montgomery and lower Satluj series a part of Multan district. The canals fed by Ravi were called Sidhnai canals and watered a part of the Multan district. Parts of Multan districts were irrigated from the Chenab inundation canals. The canals taken of from the Jehlam were mostly situated in the Shahpur district. Sirhind canal was constructed by taking water from Sutlej inundation canals. In 1868, the estimate on the work of Sutlej canal amounted to two millions sterling and it was expected that it would irrigate about 700,000 acres between the Sutlej and Jumna. The expected net revenue from this canal was about 11 percent.

The major canals either newly constructed or renovated and expanded by the British government during the second half of nineteenth century were, Western Jamuna Canal (1820- renovated in 1878), Upper Bari Doab Canal (1859), Sirhind Canal (1882), Swat River Canal (1885), Lower Sohag and Para Canal (remodeled 1885-86), Sidhnai Canal (1886) and lower Chenab Colony (1892).

In 1870s, a successful bid was made to harness the waters of sacred Jamuna by the way of remodeling the Western Jamuna Canal. The restoration of Feroz Shah’s Canal on the West bank of the Jamuna commenced during the administration of Marquis of Hastings (1814-23) and the canal was generally brought into such a state of efficiency that it was capable of irrigating 5,00,000 acres in the year 1870. By reason, however, of its faulty alignment, this canal although a very profitable work, caused loss to the country by water logging and couldn’t be extended due to insecurity of supply. In 1870, it was decided that the canal should be remodeled. In 1873, the old alignment of the canal was improved.

56 Public Works Department (Irrigation Branch), September 1868, Proceeding No. 39, N.A.I., New Delhi.

57 Public Works Department (Irrigation Branch), August 1868, Proceeding No. 99-A, N.A.I., New Delhi.

58 H.K. Trevaskis, The Punjab of To-day, op.cit, p.245.
In 1888-89, three small canals in Multan district were constructed to irrigate certain tracts which could not be covered by Sidhnai Canal. The total area irrigated by all the canals was 2,581,734 acres, showing an increase of 331,653 as compared to the previous year, 1887-88. The increase was distributed over all the canal systems of the province. The sanctioned distributary of the Sirhind Canal was completed except Bathinda Branch. The extension of distributary channels was undertaken particularly to meet the requirements of certain portions of the Ferozapore district. The tide of financial prosperity was witnessed due to the effective work undertaken by these canals. During the period between 1887 and 1888, the productive works yielded a net profit of rupees 1,64,313 after meeting all working expenses and interest charges. Even the work of minor canals which was not classed as productive works showed an increase in an annual income, the percentage of profit rising from 10.15 to 14.06 percent on the capital investment.\footnote{P.A.R. 1888-1889, pp.13-4.}

After initial experimentation, the Government launched a massive programme of reclaiming the wastelands through the establishment of a strong network of perennial canals. Agricultural colonization assumed ‘significant proportions’ with the opening of the Lower Chenab Colony (1892) and colonization of its Rakh, Jhang and Gugera Branches. The Chenab Canal was originally designed as a small inundation canal and opened as such in 1887 but in 1889, it was decided to convert it into perennial canal of the first magnitude. A weir along with headworks across the Chenab river at Khanki about 8 miles below Wazirabad was completed in 1892.\footnote{Department of Revenue and Agriculture, (Land Revenue Branch), September 1897, Proceeding No. 59, N.A.I., New Delhi.} Since then, the canal had been enlarged and extended so as to command a greater portion of Rechna Doab, the tract lying between the Chenab and Ravi rivers in the Gujranwala, Jhang and Montgomery Districts.

In 1889-90, the Lower Chenab Canal was included in the category of the perennial canals and it irrigated about 39,308 acres (in 1889-90). The sanctioned project of 1889 was followed by two other revised projects. The Lower Chenab Canal had three main branches known as the Rakh, Jhang and Gugera. The colonization on the main
branches was almost complete by the year 1902. Later on, it continued on the extensions of the Gugera and Jhang branches. In 1899, the irrigated area was about one million acres, and in 1908-09, it rose to almost two million acres.\textsuperscript{61}

With the success of the Lower Chenab Colony, the construction of the canals for colonization had gone on apace. The construction of the Lower Jhelum Canal Colony began in 1897, and five years later, the lower Jhelum Canal colony appeared in the wastes of Shahpur. It irrigated a large portion of Shahpur district and a smaller area in Jhang district. The total area to be irrigated from the lower Jhelum Canal amounted to 2,392 square miles.\textsuperscript{62} The Triple Project was one of the largest irrigation works not only in Punjab but also in India. Its main object was the irrigation of a part of the Lower Bari Doab lying between the dry bed of Beas and the river Ravi in the districts of Multan and Montgomery.\textsuperscript{63} Three canals Upper Jhelum, Upper Chenab and Lower Bari Doab were constructed which connected the Jhelum and Ravi Rivers and made it possible to colonize the Ganji Bar.\textsuperscript{64}

The new colonization scheme intended to relieve the pressure upon the land in those districts where agricultural population had already reached or was fast approaching the limit which the land available for irrigation could support and to colonize the area in question with well-to-do yeomen of best class who would constitute agricultural community of best type. Bulk of land was given to the peasants who cultivated their own holdings with the help of their families and usual menials. The peasant class formed three quarters of the population of the colony.\textsuperscript{65}

With the gradual swift of agriculturists from the relative subsistence of commercial cultivation, the age old stagnation of the Punjab agriculture was being undermined. Now the cultivators had to obtain some implements and goods from the

\textsuperscript{61} James Douie, \textit{The Panjab, North-West Frontier Province and Kashmir, op.cit}, pp.139-140.

\textsuperscript{62} M.L. Darling, \textit{The Punjab Peasant in Prosperity and Debt, op.cit}, p.113.

\textsuperscript{63} H.K. Traveskis, \textit{The Land of Five Rivers, op.cit}, p.189.

\textsuperscript{64} James Douie, \textit{The Punjab, North-West Frontier Province and Kashmir, op.cit}, p.262.

\textsuperscript{65} Revenue and Agriculture Department (Land Revenue Branch), September 1897, Proceeding No. 60, N.A.I., New Delhi.
towns and cities and to sell the growing surplus produce in the city. The villages were now more affectively integrated with the markets within and outside the Punjab.

The standard of living of the peasantry increased in the Punjab. The cultivators diet became more tasting. Three meals were taken in most of the province where two meals a day used to be the rule. Wheat became the chief staple food of the country. Another marked change was the greater use of vegetables. Every kind of vegetable was now available. Cabbage, cauliflower, potatoes and peas were all in demand. Many built *pakka* houses and clothed themselves better. The greatest change was in the canal colonies. There was a general improvement in the standard of living. In the Chenab Canal Colony, the British officers did not allow settlers to enter into the square selected for the site of the village in each *mauza* until they were prepared to build proper houses. The people paid greater attention to the rural sanitation. The British Government also worked for providing better facilities in the canal colonies. Dispensaries had been established in Gujranwala and at Khurianwala in the Jhang district by the year 1897. The British sought to avoid famines by their extensive development of canal irrigation by which they hoped to remove the extreme reliance on rainfall.

**IMPACT OF CANAL COLONIES ON THE LIVING STANDARD OF THE PEOPLE OF THE PUNJAB**

The British Government wanted to increase its income by the increase in the land revenue and water advantage rate by bringing more area under cultivation. The canal irrigation developed under the British and arid lands were converted into blooming fields of wheat, cotton and oilseeds. These colonies became the granary of India, best market for sale of British manufactured goods and producer of wheat, cotton and oilseeds for the British industries. These colonies reduced the pressure of population in highly congested districts of the Central Punjab. These canal colonies convened the barren lands into the most fertile region of India and therefore, the establishment of canal colonies was one of the most notable achievements and turning point in the socio-economic history of the Punjab. The area which before colonization could not produce enough grain for its population

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66 Department of Revenue and Agriculture, (Land Revenue Branch), September 1897, Proceeding No. 60, N.A.I., New Delhi.
became exporter of large quantities of grain. Briefly speaking, the British founded canal colonies to relieve the pressure of population in the highly congested districts of the central Punjab and to constitute healthy agricultural communities. The Lower Chenab Colony was the first major and most successful of the Punjab irrigation canal colony schemes. With the success of Lower Chenab Colony, the large scale colonization started. The Lower Jhelum Canal. Triple Canal Project were other major colonization works. Important among the minor colonies were Sidhnai, Chunian and Jhang.

Expansion of irrigation led to transition from the traditional to modern agriculture. A number of innovations were made. The old fashioned implements were replaced by the new implements made of iron like plough, sugarcane crusher, Persian wheel, chaff-cutter, harrow and drill. The introduction and wider popularity of the new and more efficient implements marked the evolutionary stage in the mechanisation of agriculture. New methods of cultivation concerning the sowing of crops and their rotation were evolved. Many new varieties of seeds of various kinds of crops suitable to climate and soil of the Punjab were introduced.

The growth of irrigation, means of transport and communications, and the introduction of new technology commercialized the character of agriculture. The importance of cultivation of more valuable crops like wheat, cotton, oilseeds, sugarcane, vegetables and fruits was recognised. In due course, the commercialization of agriculture brought handsome profits to the cultivators.

The colonization also led to urbanization and new urban centres came into being. These urban centres like Lyallpur and Multan became producing, collecting and distributing centres of furnished and specialized goods and varieties of commodities for national and international markets. New towns mostly developed along the railway lines. With the construction of railways and extension of canal irrigation to the tract, it was thought desirous to provide market accommodation at railway stations. Gradually these stations did not develop only as grain markets but also as well developed towns bearing all the characteristics of an urban centre. The tendency of urbanization or crowding of population into large towns was primarily due to the development of industries in the canal colonies.

The colonization had a civilizing impact. With the establishment of canal colonies, the tract which was once described as poorest part, came to be regarded as one of the richest parts of the Punjab. The richness led to higher standard of living and
gradually there was every sign of higher culture and civilization. The people once described as pastoral, became industrious agriculturists and residents of well-planned houses.

Lastly, the construction of the Chenab canal was the chief factor in the growth of the area covered by the Chenab colony. The irrigation helped to increase the agricultural production both by bringing more areas under cultivation and by increasing yield on the areas already cultivated. The industriousness of the peasants and their interest in agricultural technology played an important role. The acreage under the commercial crops increased. The district of Lyallpur became the model for the advancement of agriculture and civilization.

The new techniques of cultivation concerning the sowing and rotation of crops, use of manure were evolved and their value came to be highly recognized. In the most of the Punjab districts the use of drills for sowing seeds greatly increased. The sowing of cotton and maize in lines was another improvement over the old method of broadcast sowing.

With the advancement of agricultural technology, the socio-economic set up of the province experienced some significant changes. The expansion of the means of irrigation and technology brought a considerable waste land under the plough, increased the productivity and the total agricultural production of the Punjab. The means of transport and communications commercialized the character of the village economy. The wheat from the Punjab found ready markets in Europe. Its commercial success brought economic prosperity to a considerable number of land-owners of the province. Relative success of different crops played a decisive part in the cropping pattern. The pattern of marketing the produce also changed. Thus increasing income from agriculture by using improved technology changed the traditional outlook of the agriculturists. On the whole, the development of agricultural technology increased the agricultural production and commercialized the character of the agriculture in the Punjab.