CHAPTER 3

TEA PLANTATION IN DOOARS REGION
History of Tea Plantation in Dooars Region

Emperor Shen Nung is said to have introduced tea to the world in 2737 BC. Ancient Chinese and Japanese legends refer to a beverage made from an infusion of dried tea leaves (Anonymous, 1979). Lu Yu, writing in about 780 AD said that there were “a thousand and ten thousand teas”.

According to Takeo (1992) the tea plant was brought from China to Japan by a Buddhist monk in the 12th Century and this led to the production of a steamed brick tea that was used only as a medicine on in upper class society affairs. By the 16th century, Senno-Rikyu had developed the art of tea ceremony. Tea got the status of pleasant drink only after it was introduced in Japan in the 17th century. Reporting on the drink to the vanatian Geographer Ramusio in 1550, Haji Mohammed, the Arab traveler referred to the Chinese, believed that “one or two cups of the decoction taken on an empty stomach removes fever, headache, stomach, pain in the side or joints.”

According to Ukers (1935) the first authentic reference to tea is found in an ancient Chinese dictionary which was revised around the
year AD 350 by KuoP'o, a celebrated Chinese scholar towards the
dose of the 6th century.

The first book exclusive on tea “Cha Ching” or “Tea Classics”
was published around AD 780 by Lu Yu. The word ‘tea’ comes from a
Chinese ideogram pronounced “tay” in the Amoy dilect or t’e of the
Chinese Fukien dialect. In contonese, tea is known as cha. In this
form the name reached Japan, India, Russia, Iran and Middle East
from 1689 onwards the England East India Company started
importing tea from China (Weatherstone, 1992).

Organized research in tea commenced with the appointment of
M. Kelway Bamber, Chemist by Joint Committee of the ITA and the
Agriculture and Horticultural Society of Bengal in 1891. In 1893 Dr.
George Watt and Entomologist with the Government of India took
over the investigation. Dr. Harold H. Mann was appointed as the
scientific officer in 1900. Under his supervision a tea research center
was established in 1911. Tea Research Association constituted in
1964, took over the management of Toklai and its outstations.
According to the Assam Directory, 2002-03, Dooars Region has as many
as 89 big tea estates and numerous small tea estates which provide raw
materials to more than 150 registered tea processing industries of the
district.
Tea seeds were first showed in 1835 in an experimental nursery at Labong from Darjeeling Hills. In 1874 the first tea garden in Dooars came up. The Dooars Region has long history of tea plantation and more than 11 per cent of the net sown area of the district is permanently occupied by tea plantation. According to the Assam Directory, 2002-03, it has as many as 89 big tea estates and numerous small tea estates which provide raw materials to more than 150 registered tea processing industries of the district.

**Geographical Conditions for Tea Plantation**

Tea is an important agriculture which has been spreading with time. Dooars has been producing finest quality of tea in the world fetching the highest price starting on a commercial scale in 1856. Tea requires unique climatic conditions for its survival. Following agro-ecological conditions are essential for the growth of tea plants.

**Table 3.1**

<table>
<thead>
<tr>
<th>Ecological conditions</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH of soil</td>
<td>4.5 to 5.5</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>20-30°C (max. 35°C)</td>
</tr>
<tr>
<td>Leaf temperature</td>
<td>Min 21°C (max 39°C)</td>
</tr>
<tr>
<td>Soil temperature</td>
<td>Not less than 20°C for optimum 25°C</td>
</tr>
<tr>
<td>Day length</td>
<td>Not less than 11 hours 15 mints.</td>
</tr>
<tr>
<td>Rainfall</td>
<td>1000-1400 mm of annual rainfall</td>
</tr>
<tr>
<td>Relative Humidity</td>
<td>80-90%, below 50% generally shoot growth is inhibited below 40% growth is adversely affected.</td>
</tr>
</tbody>
</table>
Rainfall is one of the most important factor determining tea yield. Tea is a rain fed crop. Distribution of rainfall is found to be more vital than the total rainfall for successful tea culture. Persistent rainless condition causes drought and prolonged drought could be lethal. Air and soil temperature also play a vital role in crop growth and development. Temperature regulates almost all physiological processes by its influence on the activity of enzymes. Higher temperatures increase the transpiration rate and cause wilting of plants. During high temperature regime the enzymes are denatured: Extreme low temperature brings about injury due to chilling and freezing, mainly because of disruptive crystalla formation. There is a very positive correlation between soil temperature and shoot growth. Light of the day also affects the physiological activities like to photosynthesis, respiration, stomata functioning etc and indirectly affects the productivity of tea plant. Tea bushes are known to be benefited by high humidity; low relative humidity adversely affects the physiological processes by influencing the cell sap concentration.

Tea can grow on various types of soil as detailed below:

<table>
<thead>
<tr>
<th>Soil Type</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alluvial</td>
<td>North Eastern Tea Gardens</td>
</tr>
<tr>
<td>Sedimentary</td>
<td>Darjeeling Hills</td>
</tr>
<tr>
<td>Lotosols</td>
<td>South Indian Tea Plantations</td>
</tr>
<tr>
<td>Volcanic</td>
<td>Indonesia and Kenya</td>
</tr>
<tr>
<td>Dialuvial</td>
<td>Japan and Taiwan</td>
</tr>
</tbody>
</table>
Physical properties of soil should be deep, porous and friable to a good depth of more than 3 feet. There should be no hard pan even in the sub soil. Soil should be light to medium textured i.e. it should contain at least 50% sand. Tea does not survive in water logged condition, although it requires sufficient moisture for its growth.

Flavours of Tea in Dooars Region

The flavour of tea is a complex perception. There is a certain flavour dynamic. Most of the teas can be described as having a foreground flavour, middle ground flavour and background flavour. All of the individual leaves of each growing region are basically identical. However, a well-balanced profile of each growing region falls within specific profile outlines. An unbalanced profile looks ragged (somewhat like a saw blade) and therefore becomes somewhat less pleasant to drink. This unbalanced profile can be caused by many things, low attitude, improper pluck, poor processing, bad manufacturing, exposure to water or excessive moisture, to name a few. Tea is like the little girl; when it is good it is very good and when it is bad it is horrid.

Flavour is a combination of two sensory perceptions: taste and odour or aroma. The first part of the flavour duo of taste and aroma is perceived by the taste buds and other sensory tissues on the
taste buds are generally located in very specific areas on the tongue (sweet in front, salt next and along the sides, acid (sour), bitter in the rear and from side to side covering the back of the tongue. However, all types of taste buds can be found located sparsely throughout the tongue’s entire surface.

Secondly, one must consider the sense of smell when discussing what makes up flavour perception. One’s sense of smell, or odour, is one’s reaction to the stimulus of volatile components found in the tea which we consume. It is these volatiles that evaporate up into the nasal cavity (retro-nasally) and stimulate the nerve endings in the olfactory bulb region. The fact that we also smell food as we taste. It is the reason why we cannot “flavour” things well when we have a cold. It is also the reason why it becomes difficult, if not impossible, to discern the difference between an apple and a potato when we tightly hold our nose and chew them separately. The texture is similar and that is all that we seem to perceive.

Physical Aspects of Tea

Physical aspects of tea come very much into play:

(a) Mouth feel: Astringency (dryness) and slipperiness (that reaction which follows immediately after astringency in a very good tea).
(b) The tea preparation system affects the solubility and the corresponding vapour pressure of each volatile. Tea should be made in a lidded vessel to contain the volatile and vital aromatics it contains, not in an open cup. And, further, the tea pot or lidded cup should be appropriate in every aspect to the tea which is being infused inside of it.

(c) The condition (physical, mental, overall health, age, etc.) of those pertaining to tea is of major concern since these conditions will effect flavour acuity.

One theory of flavour perception, although somewhat antiquated, is a more stereo chemical theory. It is an old theory but it remains a good model for explaining many aspects of flavour perception. It treats volatiles as jigsaw pieces that can fit into various receptor "holes" in the nerve endings of the olfactory bulb. The shapes of these "holes" can be categorized into different groups. These groups correspond to specific odour types, the so called simplest or most basic odours in nature. The theory states that all flavours can be described as combinations of these simplest odours. More recent theories postulate a model of odour perception which makes the analogy between odour perception and the similarity of chemical action of an enzyme on a substrate or one layer of receptors lying under another on the nerve endings and that the odour
molecules penetrate down through these layers thus prompting many subtle flavour changes.

**Tea Plucking in Dooars**

Plucking consists of collecting the newly grown shoots. The youngest leaves and buds have highest caffeine content and produce best quality of tea. The length of time from planting to plucking depends on the type of material planted, period and environment. Plucking is usually done by women who go round the bushes and collect the new flushes in the baskets. In Dooars conical cane baskets are used for plucking. The plucking is best done in the late morning (10 AM to 2 PM) hours to give good crop yield and to enable the bush to recover. The flushes are lightly placed in the baskets to avoid injury and rise in temperature leading to the deterioration in the quality.

There are two types of plucking, viz., standard and coarse. In the former type, two leaves and a bud are plucked as soon as the shoot has grown to that extent, while in case of latter type more than two leaves and a bud is plucked. The period of plucking or round period varies from one area to another. In Dooars 5-7 days round and in Darjeeling mostly 5 days round is done, while in South India, the plucking is done throughout the year. Interestingly, inspite of introducing various tea technologies in India, the mechanical
plucking has not been successful due to ecological reason among which is unleveled nature of land in Indian tea growing areas. Only in certain areas which have scarcity of labour, the mechanical plucking is done.

**Pruning of Tea**

Most probably, from the productive point of view, pruning is the most important aspect of field practices. Pruning is very important as it maintains the plant for continuous growth and low bush size. Pruning is therefore considered as at least a necessary evil because it stimulates growth and development. The other objectives of pruning are as follows:

(a) Shaping the tree to make the best use of space between the trees.
(b) Removing dead, diseased and over age wood thus to help rejuvenate bushes that have crossed the period of maximum productivity.
(c) Reestablishing the initial vigour of shoot system to stimulate, grow and control undue rise in bush frame/plucking.
(d) Providing an environment within the plant which is conducive to maximum crop production but minimize the spread of pest and diseases.
(e) Having the crop formed where it can be harvested easily and cheaply.
(f) Renewing actively the growing branches and maintaining sufficient volume of maintenance foliage and to meet physiological needs of the plant and finally maintaining quality in made tea.

In order to maintain a particular pruning system, plant variety, environmental factors and general growing conditions are important. The main significance of pruning is to have optimum amount of wood so that the plant remains in a steady state of productivity. Basically, pruning system is determined from the balance of growth of the plant in relation to productivity. Pruning is therefore considered as an important factor which affects the plant as a whole and also for the maintenance of an adequate food reserve because pruning itself removes a part of food in circular within the plant.

**Types of Pruning**

Mainly, there are collar, medium, lung and skiffing pruning in the country tea gardens today. Collar pruning is the severest form of pruning which involves the cutting of the bole of bush near or at the ground level. The main objective of collar pruning is to provide a new frame to the plant by removing old and unproductive branches affected by diseases and pests. The main objective of medium pruning is to reduce the height of the bushes so that they do not
exceed 80 cm. Generally, the medium pruning is not done below 50 cm and certainly not lowers than what is necessary to remove the knots and congested top.

The major objective of the light pruning as done in Dooars is to renew the leaf bearing branches apart from cleaning out the bushes. Normally, this pruning is done at the height of 2 to 3 cm. above the last prune. This pruning also involves immediate cleaning of unproductive branches and dormant shoots. The objectives of lung pruning is to be selective enough with the plants leaves as all the leaves below the level plucking are left unpruned. The major objective of skiffing is not only to have an early start in crop production but also to achieve more of the high quality first flush and total crop as well. Skiffing helps in thickening the pruning woods and improve the general health of the bushes. Skiffing is an operation aimed at forming a level and a flat plucking surface and filling up by quick production of secondary branches.

**Pest and Diseases of Tea Plant**

The root diseases of the tea bush are mainly as root-splitting or shoe-sting fungus on the roofs of the tea plants. Similarly, there are many diseases in the branches of the tea bush. They are known as branch canker, pink disease, die-back, stump rot, red rust etc. In the
same fashion, there are red diseases in the leaf of the bush. They are known as blister blight, black-rot, brown blight and grey blight. Again there are many pests in the tea bush. They are as mites, termites, scales, aphids, shot hole borer, thrips, purple mites, pink mite and tortrix. These diseases can be eliminated by administering various types of medicines such as pesticides and weedicides etc.

**Rolling of Tea Leaf in Dooars**

The withered tea leaf normally passed on to rollers in which the tea leaves are sufficiently twisted. The rolling is usually done for 30 minutes and finer portions of leaves are allowed to ferment whereas the coarser portions of the tea leaves are subjected to heavy rolling again. Sometimes even third rolling is done. There are three major manufacturing methods available in our country. They are viz., Orthodox which involves non-cutting rolling, crushing, tearing and curling (CTC) which involves rotovances and cutting, rolling and Laurie tea process (LTP) that are normally administered hammer mill type cutter.

The Orthodox processes use the conventional crank rollers while in case of CTC machine consists of two engraved metal rollers operating like a mangle and gives an instantaneous nip of the leaf. Now it is seen that many factories have been using the rotoravane which acts like common domestic mincing machine, to
preconditioning the withered leaf prior to feeding to CTC machine. A point to be noted here is that orthodox produces more caffeine and volatile flavour than CTC. In Dooars Region, a different method known as Legg cut manufacturing method have also been adopted in the recent years. In this method, the fresh leaves are directly processed and liquor is made from the tea leaves. It does not involve withering and rolling of tea leaves in the factory.

**Fermenting of Tea Leaf**

The main operation in the tea manufacture of black type is enzymic oxidation which is also known as fermentation. In this process, the fresh tea leaves which contains 25% of solid matter are full of many types of acids, substances etc. The fermentation brings about polyphgenolic which again converted into yellow coloured and red coloured and brown coloured types which helps to have a high level of liquor. The various fractions of rolled leaf are spreaded on clean cement floors or other suitable platforms to the thickness of 2.5 to 10 cm. And allowed to ferment for 2-4 hours under high humidity and low temperature (24 to 26.5°C). Here the colour of the leaf changes from green to bright, coppery and red types. Caution is to be given here not to allow for over-fermentation. Today in some places a new type of method of fermentation has also been done using rotating drums to get new type of made tea.
**Sorting and Grading of Tea Leaf**

After firing the tea leaf contains different types of sizes, dust of different sizes. Sorting of the fine tea is done in the first stage and remaining types are also accordingly sorted and finally the biggest one is taken out from the stock. Especially chromatic stalks are used in many factories. But the best method is by human hands as universally accepted. The three main types of CTC are broken, fanning and dusts. Similarly, there are four sizes of Orthodox tea. They are viz., whole leaf broken, fanning and dusts. The whole leaf grades consists of tippy golden orange pekoe, flowery broken orange pekoe, broken orange pekoe and broken pekoe fannings, golden orange fannings, orange fanning and dust consists of pekoe dust, dust one simply dust.

**Packing of Tea in Dooars Region**

Different types of tea are packed in plywood boxes lined with aluminum foil and parchment paper. Each box has the capacity of 40 to 50 kgs and Tea leaf 50 to 60 kgs of broken tea leaf. During sorting, the tea invariably absorbs additional moisture of course in different manner depending on the humidity and temperature of sorting room. It is therefore said that there should at least be 65 per cent relative humidity in the sorting room of tea. The product may require second firing before packing and even post fermentation or mellowing are
also done. So, maintaining quality is another important part of manufacture process for which standard type of wood tea chests are made and this wood-chestes can keep the tea fresh for nine months if proper storage system is there.

**Uses of Tea**

Tea as common beverage for man is very old and less expensive. It is consumed by millions of people all over the world. Tea is drunk for getting stimulus being given by caffeine and acquiring warmth in the human body. For getting good flavour, the tea leaf must be boiled in hot water. The preparation of tea differs from one type of tea to another type.

Besides drinking purpose, tea is also used as nutritional value. Tea provides carbohydrates, proteins and several other vitamins. The tea leaves contain corotene, nicotine, pantothenic, ascorbic and riboflavin. Niacin is maximum in the bud and quite less in the steams. Tea is stimulating drink which relieves muscular and mental tiredness and also does away with fever. The stimulating effect of tea does not produce any depression or hangover later on. Again, Caffine helps to produce urine and gastic secretion. It also helps to aid digestion and resist post-pendial distresses. Tea also normalizes intestinal functions. Tea also adds value in treating gout and restores fluid-balance after vomiting and diarrhoea. The property like diuretic
of tea is immensely useful for treating therapy of cardiac oedema, reduce serum lipid, and induce synthesis and secretion of catecholamines and atherosclerosis. Tea polyphonols helps to strengthen the walls of blood-vessels and regular permeability and activity related to vitamin known as Biflavonoids. It also inhibits absorption of dietary cholesterol. There is an indication that tea can stimulate degradation of triglycerides in the adipose tissue which helps to reduce the excessive weight of the persons. It helps to treat asthma disease. The spray prepared from tannis of tea cures allergies. The tea also helps to reduce acidity in the human body. Since tea has anti-bacterial activity, the problem like dysentery can be overcome. The tea also inhibits the growth of cancer tumours. Even the death rate of the people has been reduced by the use of tea especially stomach cancer. The dental disease can also be overcome by the use of tea. It is also said to prevent the formation of stones in the bladder, liver and kidney. Tea is also used for livestock population.

During the period of 2000-01 the total area in the district of Darrang was 41037 hectares which produce 77030 thousand kgs tea leaf with a yield of 1877 kg/hectare. In the year of 2001-02 the area under tea in the district remains 41233 hectares while production increased to 78224 thousand kgs. with a yield of 1897 Kg/hectare.
Again in 2002-03 area increased to 41450 hectares and production decreased to 73950 thousand kgs with a yield of 1784 Kgs/hectare.

During the period of 2000-01 the total area in the district of Goalpara was 3460 hectares which produced 6297 thousand kgs tea leaf with a yield of 1820 Kgs/hectare. In the year 2001-02 the area under tea in the districts decreases to 3454 hectares while production decreased to 6223 thousand Kgs with a yield of 1802 Kgs/hectare. Again in 2002-03 area does not observed significant change but production decreased to 6100 thousand Kgs with a yield of 1766 Kgs/hectare.

Table 3.2
A comparative assessment of Area, Production and Yield of Dooars Region with the major tea producing districts of Assam and West Bengal during 2000-01

<table>
<thead>
<tr>
<th>Districts</th>
<th>Area (hectares)</th>
<th>Production (1000kgs)</th>
<th>Yield (kgs/hectares)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Darvang</td>
<td>41037</td>
<td>77030</td>
<td>1877</td>
</tr>
<tr>
<td>Goalpara</td>
<td>3460</td>
<td>6297</td>
<td>1820</td>
</tr>
<tr>
<td>Kamrup</td>
<td>3442</td>
<td>4302</td>
<td>1250</td>
</tr>
<tr>
<td>Lakhimpur</td>
<td>4815</td>
<td>9068</td>
<td>1883</td>
</tr>
<tr>
<td>Dibrugarh</td>
<td>93076</td>
<td>163426</td>
<td>1756</td>
</tr>
<tr>
<td>Nowgong</td>
<td>7994</td>
<td>11788</td>
<td>1475</td>
</tr>
<tr>
<td>Sibsagar</td>
<td>74807</td>
<td>119978</td>
<td>1604</td>
</tr>
<tr>
<td>Cachar</td>
<td>32008</td>
<td>49206</td>
<td>1537</td>
</tr>
<tr>
<td>Karbi Anlog</td>
<td>1869</td>
<td>1945</td>
<td>1041</td>
</tr>
<tr>
<td>North Cacher</td>
<td>44004</td>
<td>6179</td>
<td>1543</td>
</tr>
<tr>
<td>Darjeeling</td>
<td>17228</td>
<td>9281</td>
<td>539</td>
</tr>
<tr>
<td>Terai</td>
<td>20548</td>
<td>43291</td>
<td>2107</td>
</tr>
<tr>
<td>Dooars Region</td>
<td>69703</td>
<td>128964</td>
<td>1850</td>
</tr>
</tbody>
</table>

Source: Tea Board of India, Tea Digest 2002
During the period of 2000-01 the total area in the district of Kamrup was 3442 hectares which produce 4302 thousand Kgs of tea with a yield of 1250 Kgs/hectare. In the year 2001-02 the area under tea in the district decreased to 3436 hectares while production increased to 4585 thousand Kgs tea with a yield of 1334 Kgs/hectare. Again in 2002-03 area increased to 3440 hectares while production and yield decreased to 4300 thousand kgs, and 1250 kgs/hectare respectively.

The total area in the district of Lakhimpur was 4815 hectares during the period of 2000-01 which produce 9068 thousand kgs of tea with a yield of 1883 Kgs/hectare. In the year 2001-02 the area under tea decreased to 4727 hectares while production increased to 9113 thousand Kgs with a yield of 1928 Kgs/hectare. Again in the year of 2002-03 area increased to 4800 hectares but production of tea decreased to 8950 thousand Kgs with a yield of 1864 Kgs/hectare.

During the period of 2000-01 the total area in the district of Dibrugarh was 93076 hectares which produce 163426 thousand Kgs of tea with a yield of 1756 Kgs/hectare. In the year 2001-02 the area under tea in the district increased to 94080 hectares while production increase to 166504 thousand Kgs with a yield of 1770 kgs/hectare. Again in 2002-03 area spread 94500 hectares while production decreased to 154550 thousand kgs with a yield of 1935 Kgs/hectare.
The total area of Nowgong district was 7994 hectares in the year 2000-01 which produced 11788 thousands kgs tea with a yield of 1475 kgs/hectare. In the year 2001-02 the area under tea in the district increased to 801 hectares while production increased to 11793 thousands Kgs with a yield of 1474 Kgs/hectare. Again in the period 2002-03 area increased to 8100 hectares while production and yield decreased to 11100 thousand Kgs and 1370 Kgs/hectare respectively.

Table 3.3
A comparative assessment of Area, Production and Yield of Dooars Region with the major tea producing districts of Assam and West Bengal during 2001-02

<table>
<thead>
<tr>
<th>Districts</th>
<th>Area (hectares)</th>
<th>Production (1000 kgs)</th>
<th>Yield (kg/hectares)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Darvang</td>
<td>41233</td>
<td>78224</td>
<td>1897</td>
</tr>
<tr>
<td>Goalpara</td>
<td>3454</td>
<td>6223</td>
<td>1802</td>
</tr>
<tr>
<td>Kamprup</td>
<td>3436</td>
<td>4585</td>
<td>1334</td>
</tr>
<tr>
<td>Lakhimpur</td>
<td>4727</td>
<td>9113</td>
<td>1928</td>
</tr>
<tr>
<td>Dibrugarh</td>
<td>94080</td>
<td>166504</td>
<td>1770</td>
</tr>
<tr>
<td>Nowgong</td>
<td>8001</td>
<td>11793</td>
<td>1474</td>
</tr>
<tr>
<td>Sibsagar</td>
<td>75864</td>
<td>19626</td>
<td>1577</td>
</tr>
<tr>
<td>Cachar</td>
<td>32272</td>
<td>50296</td>
<td>1559</td>
</tr>
<tr>
<td>Karbi Anlog</td>
<td>1869</td>
<td>1929</td>
<td>1032</td>
</tr>
<tr>
<td>North Cacher</td>
<td>44047</td>
<td>5643</td>
<td>1394</td>
</tr>
<tr>
<td>Darjeeling</td>
<td>17318</td>
<td>9742</td>
<td>563</td>
</tr>
<tr>
<td>Terai</td>
<td>21467</td>
<td>46395</td>
<td>2161</td>
</tr>
<tr>
<td>Dooars Region</td>
<td>70017</td>
<td>13330739</td>
<td>1867</td>
</tr>
</tbody>
</table>

*Source: Tea Board of India, Tea Digest 2002.*
During the period of 2000-01 the total area in the district of Sibsagar was 74807 hectares which produce 119978 thousand Kgs of tea with a yield of 1604 Kgs/hectare. In the year 2001-02 the area under tea in the district increased to 75864 hectares while production decreased to 119626 thousand Kgs with a yield of 1577 Kgs/hectare. Again in the year 2002-03 area of tea increased to 76200 hectares but production and yield decreased to 113950 thousand Kgs and 1495 Kgs/hectare respectively.

In the district of Cachar the total area occupied by tea was 32008 hectares during 2000-01 which produce 49206 thousand Kgs with a yield of 1537 Kgs/hectare. In the year 2001-02 the area under tea in the district increased to 32272 hectares while production increased to 50296 thousand Kgs with a yield of 159 Kgs/hectare. Again in the year 2002-03 area changed to 32300 hectares while production increased to 51965 thousand Kgs with a yield of 1609 Kgs/hectare.

During the period of 2000-01 the total area in the district of KarbiAnlog was 1869 hectares which produce 1945 thousand Kgs of tea leaf with a yield of 1041 Kgs/hectare. In the year 2001-02 the area under tea in the district remains constant while production decreased to 1929 thousand Kgs with a yield of 1032 Kgs/hectare. Again in the year 2002-03 area was constant but production and yield decreased to 1846 thousand Kgs and 988 Kgs/hectare respectively.
The total area in the district of North Cacher was 44004 hectares during the period of 2000-01 which produce 6179 thousand Kgs of tea leaf with a yield of 1543 Kgs/hectare. In the year 2001-02 the area under tea increased to 44047 hectares while production decreased to 5643 thousand Kgs with a yield of 1394 Kgs/hectare. Again in the year 2002-03 area increased to 45050 hectares while production and yield increased to 5800 thousand Kgs and 1432 Kgs/hectare respectively.

**Table 3.4**

A comparative assessment of Area, Production and Yield of Dooars Region with the major tea producing districts of Assam and West Bengal during 2002-03

<table>
<thead>
<tr>
<th>Districts</th>
<th>Area(hectares)</th>
<th>Production (1000 kgs)</th>
<th>Yield (kgs/hectares)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Darvang</td>
<td>41450</td>
<td>739650</td>
<td>1784</td>
</tr>
<tr>
<td>Goalpara</td>
<td>3454</td>
<td>6100</td>
<td>1766</td>
</tr>
<tr>
<td>Kamrup</td>
<td>3440</td>
<td>4300</td>
<td>1250</td>
</tr>
<tr>
<td>Lakhimpur</td>
<td>4800</td>
<td>8950</td>
<td>1864</td>
</tr>
<tr>
<td>Dibrugarh</td>
<td>94500</td>
<td>154550</td>
<td>1935</td>
</tr>
<tr>
<td>Nowgong</td>
<td>8100</td>
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<td>51965</td>
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<tr>
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<tr>
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<tr>
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<td>2180</td>
<td>36491</td>
<td>1674</td>
</tr>
<tr>
<td>Dooars Region</td>
<td>70200</td>
<td>142623</td>
<td>2032</td>
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*Source: Tea Board of India, Tea Digest 2002.*
During the period of 2000-01 the total area in the district of Darjeeling was 17228 hectares which produce 9281 thousand Kgs with a yield of 539 Kgs/hectare. In the year of 2001-02 the area under tea in the district increased to 17318 hectares while production also increased to 9743 thousand Kgs with a yield of 563 Kgs/hectare. Again in the year of 2002-03 the area increased to 17400 hectares and production increased to 10727 thousand Kgs with a yield of 616 Kgs/hectare. The total area of the Terai region was 20548 hectares in the year 2000-01 which produce 43291 thousand Kgs with a yield of 2107 Kgs/hectare. In the year 2001-02 the area under tea increased to 21467 hectares while production increased to 46395 thousands Kgs with a yield of 2161 Kgs/hectare. Again in the year 2002-03 area of tea increased to 21800 hectares but production and yield decreased to 36491 thousand Kgs and 1674 Kgs/hectare respectively.

During the period of 2000-01 the total area in the Dooars Region was 69703 hectares which produce 128964 thousand Kgs of tea leaf with a yield of 1850 Kgs/hectare. In the year 2001-02 the total area under tea increased to 70017 hectares while production increased to 130739 thousand Kgs with a yield of 1867 Kgs/hectare. Again in period of 2002-03 area increased to 70200 hectares while production and yield increased to 142623 thousand Kgs and 2032 Kgs/hectare respectively.
Economy

The economy of Dooars Region is based on three T-s, Tea, Tourism and Timber. The main industry of the Doors region is tea industry. Thousands of people are engaged in the tea estates and factors as labours and other posts. Several people are also engaged in cultivation of Bettlenuts which also contribute to the economy. Cultivation of other crops is done mainly for local consumption.

The Region Dooars is dotted by several national parks and wildlife sanctuaries which attract a lot of tourists from all over India and abroad making an important contributor to the economy and also employs a lot of people in this sector.

Timber industry both legally and illegally flourish in this region. Number of saw mills, plywood industries and other allied business also acts as an important contributor to the economy. Dooars area acts as doorways to Bhutan thus export-import industries also flourish in the area. The town of Jaigaon, Siliguri and Phuentsholing are important hubs of export-import industry.

As the region Dooars is near the international borders of Bhutan, Nepal and Bangladesh, the Border Security Force (BSF), Central Reserve Police Force (CRPF), military and Indian Air Force maintains a large presence in the area. This leads to a large
population of semi permanent residents who bring money into the local economy.

**Industrialization and Importance of Plantations**

The British role was a long story of the systematic exploitation by an alien government of a people whom they had enslaved by their policy of divide and rule. Though industrialization started in the 19th century, the Britishers were more interested in their profit and not accelerating the economic progress of India as a whole. The British rules drained away the economic surplus from India to England in different ways. They prevented the establishment of those industries in India which might compete with those already established in England. They laid more stress on the development of communication etc. to safeguard their monopoly in India and also on agricultural products like tea, coffee, rubber, etc. for the interest of the Britishers. The raw materials for the industries in England were sent from India and the finished products were sold to India at the cost of the Indian people. In this way, India was converted into an agricultural colony of British/Britain.

The process of industrial transition which started in the 19th century was mainly in private sectors. Some ex-employees of the East India Company started coffee, tea and rubber plantations. The period 1850-55 saw establishment of first cotton mill in Bombay (1854), the
first jute mill near Calcutta (1854), and first coal mine in Raniganj (1854). The factory system was a new development and it paved the way for industrialization. The Indian industry had to weather all storms and face World competition on its own strength. Only after First World War some protection was granted to Indian industries. Gradually, other industries such as, woolen mills, paper mills, petroleum and manganese industries also came into existence during this period. Tata iron and works were also established simultaneously. But no heavy industry and Machine Tool industry were established during these periods which were very much essential for industrial development.

**Plantation Systems**

Plantation is no doubt akin to agriculture but these are most consolidated and scientific systems of production in agricultural sector, so far the production of tea is concerned. The plantation industries are playing a pivotal role in the advancement of agriculture in their own fashion for their being large scale enterprises in most of the producing countries in the world. It is also to be noted that the plantation industries were established and developed in tropical countries in a particular form on colonial agriculture as a result of colonial expansion and many of the patterns that were introduced at the initial stage in the matters of cultivation,
production and administration are still in vogue at the present day situation along with the colonial system of exploitation of the laborers despite of attaining independence by many countries.

Plantations can also be seen as total institutions, being both units of agricultural production and social institutions. The colonialist economic policy designed plantations to create an institution in production system that would be able to produce agricultural products at a very low cost. This was necessary to strengthen the industrial sectors of Europe which consumed these agricultural products. Thus the characteristics of plantations were created by a design to exploit land and labour for the purpose of having cheap agricultural products. It can also be stated that the impoverishment of most of the developing countries began in the colonial economic relations since the industrial revolution in Europe. So, the plantation systems are the by-products of the colonial economy and the scenario in this respect is almost same in different countries whatever political system may exist in those countries.

Although the plantation industry in Asia is more than a century old, it is significant to observe that while the industry has always contributed to the growth of nation’s wealth, the workers who contributed much for this national wealth, have always lived in conditions of poverty both in absolute and relative terms. Even that
the plantation workers are a poverty stricken group in Asian societies.

**Economy of Tea Industry**

Tea as common beverage has assumed a great importance in global market and is playing a pivotal role in the national economy of so many developing countries, after 16th century during the era of western expansion to the east.

The world tea economy has been a subject of numerous intellectual enterprises and every aspect of tea industry has been purified by the scholars; be it on the discovery of tea plant or development of tea plantations in different countries in the world.

The available record goes on to say that one Christopher Borough who accompanied a trading expedition to Persia in 1579, is credited for having introduced tea in England. The British East India Company established in 1600, imported tea in England in 1664 most probably from Holland and after that the British were envincing keen interest in tea consumption. It is said that the first tea drinking Queen of England was the Queen of Barganza who could not continue without tea (Sharma, 1987). The company had a very good trading relation with China and tea used to be imported to that country from China as per trade agreement. But this relation for trading on tea with China did not last long and began to strike a sorry note during
1800-33. By this time the Britishers were very much addicted to tea drinking and for their necessity, they were determined to find out suitable place in their vast empire for cultivation of tea at any cost and even by expansion of their territories and they did it accordingly.

Since independence efforts are being made by the Govt. of India for the upliftment of the quality of life of the people in general and plantation population in particular who are completely in backward and down trodden conditions, but their condition remained same as it was hundred years back. The socio-economic conditions of the plantation workers are horrible and they are languishing day by day due to apathetic and indifferent attitudes of both the planters and the Govt. and for following the same way of exploitation as adopted by the erstwhile British planters. As we know, the plantation workers are a captive population in their work situation with relatively a very poor or no linkage with the society at large and are having poor access to public goods and services, such as, schooling, medical care, employment and other development facilities provided by the rural development schemes and Panchayat System of administration etc.

**Socio-economic settings of Tea Plantation in Dooars Region**

The socio-economic condition of Dooars Region exhibits quite different panorama than that of the industrial workers in other
industries. Majority of the tea workers are still in darkness of illiteracy and ignorance. If we peep into their social life, we find that they are poverty stricken, socially and economically most backward. The reasons for their depressed conditions are also to be counted on this score. According to the present system, employment is offered to the wives of the workers at the first available opportunity and also to the employable children above the age of 14. In view of the system of recruitment and the method of employment, the ratio of employment of men and women including the employable children in the tea estates is almost equal. The family of a plantation worker, therefore, consists of, unlike the industrial workers, a working wife, working children and non-working children. The family may consist of dependent parents and other near relatives. According to the enquiry made by the Labour Bureau, Government of India in 1958-59 as to the family budget amongst the plantation labour along with the industrial workers in different centers in India, it is noticed that there were between 4-5 members in a family of a plantation worker with 1-2 earning members (Mukherjee, 1967).

The consideration of wages in the plantations can not be completed without a reference to the concessions and prerequisites that are offered to the workers in addition to their cash wages. The main concessions which are to be taken as fringe benefits are:
• Concessional supply of food stuff
• Free Housing
• Land for cultivation (where available)
• Free medical attention including hospitalization and maternity benefits
• Free primary education
• Paid festival holidays
• An allowance of free tea of a small quantity

It will be seen from the facts stated above that the tea plantation workers were languishing during the British regime but after Independence and passing out of the Plantation Labour Act in 1951 by the Government of India and also relevant rules by the State Governments, their economic conditions started to improve. Their wages have been raised further by the agreements between the workers organizations and the employers' associations. The workers' organizations in the plantation industry have strengthened and consolidated their position as bargaining agents and as a result, the workers are getting more and more in addition to their wages such as Bonus, Pension, and Gratuity etc.

Though the wages of the tea plantation workers have been increased along with the quantum of Bonus etc. still their socio-economic conditions have not been improved. If one visits the tea gardens during payment dates or during the payment of bonus etc., he
will see how the tea workers are behaving and spending their earnings. Perhaps, alcoholism is the most serious disease that has affected each and every individual tea worker including the children who are indulged in this line by their parents themselves. Unemployment problem is another contributory factor engagement of workers in preparing and selling 'cholaimad' which is dangerous trend prevailing amongst the tea garden community.
References

200 years of Ceylon Tea by Forest D.N., Chatto & Windus, London.