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**PLANTATION INFRASTRUCTURE AND THE  
PERFORMANCE OF ASSAM'S TEA  
SECTOR: AN ANALYSIS ON THE  
SMALLHOLDING TEA PLANTATION  
SECTOR**

**Kalyan Das**

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## **ABSTRACT**

It has appeared that in the highly productive tea smallholding sector of Assam there is mismatch of production of green tea leaves and the processing capacity of the factories to accommodate the flush. The limit set by the factories on the supply of tea leaves produced by the smallholders has few repercussions. In addition to the possibility that a proportion of tea leaves remain un-plucked or not plucked, a fair price for tea leaves is not ensured to the smallholders in an unregulated environment of price fixation. This limits margin of profit, which finally affects investment in maintenance in the smallholdings. Moreover, an assessment on the operational hours lost by the tea factories due to erratic electricity supply reveal additional constraints in the tea sector. Arrangement of alternative power though has prevented the wastage level of green tea leaves it raises operational costs of the factories. The decision to acquire a backup power is however considered a rational decision on the part of the factories as the cost of not having backup is larger in frequent power cut situation. This paper consolidates the argument that adequate provisioning of public infrastructure help to reduce the cost of production and thus raise competitiveness and inclusiveness of a production sector. While the bearing of low productivity and high labour cost on competitiveness has attracted the attention, the influence factors like infrastructure in production, processing and marketing seems to have not received much attention. Hence this paper explores the influence of infrastructure on the performance of tea sector by taking the case of smallholding sector in Assam.

## Introduction

It is often argued that the competitiveness of India's tea sector is adversely affected by low productivity<sup>1</sup> and high labour costs<sup>2</sup>. The low productivity arises *inter alia* because of the predominance of old plantations and negligence in maintenance. In India about 44 per cent of the area under tea is more than 40 years old waiting for re-plantations. Since 1991 no single year shows more than 0.4 per cent re-plantation in the tea acreages (Tea Statistics, Tea Board of India various years). No doubt these old plantations lead to lack of competitiveness of the tea sector in the world market. The share of Indian tea in the world market stood at 11 per cent in 2011 behind Kenya, Sri Lanka and China. Although India has a huge domestic market, the survival in an open economy context is contingent on international competitiveness. Moreover, Indian tea at present is not commanding best prices in the world market as compared to Sri Lanka, Kenya, Mauritius and Japan (Tea Statistics, and Annual Bulletin of Tea Board of India, various years). While the bearing of low productivity and high labour cost on competitiveness has attracted the attention, the influence of other factors like infrastructure in production, processing and marketing seems to have not received the attention of scholars that it deserves. Hence, the present paper explores the influence of infrastructure on the performance of tea sector by taking the case of Assam.

The inquiry assumes added importance in the context of recent changes in the holding structure of tea plantations. It has been shown that, during the recent past there is a clear trend towards the domination of smallholdings. Area under tea smallholdings in 1991 (captured by the Tea Board of India with size class of less than 8.1 hectare) was just

10,853 hectares or 2.6 per cent of the total tea acreages. The smallholdings were concentrated mostly in the South India. Over the years the smallholdings have emerged in the areas dominated by estates (Assam and West Bengal). In the year 2006 areas under tea smallholdings constituted 154,099 hectares (27.2 percent of total acreages of tea) with a size class of less than 10.1 hectare (the size criterion revised by Tea Board of India) and accounted for 25.4 per cent of total production. On the other hand, acreages under estate sector of tea declined in India from 409,684 hectare to 401,512 hectare (-1.99 per cent) during 1991 to 2006. In Sri Lanka smallholdings now compensates the failure of the estate sector contributing 66 per cent of the total production from 44 per cent tea acreages under its possession.

Tea smallholdings in Assam initiated in early 1980s and the number had increased to 48,292 in 2005 (Tea Board of India, 2006)<sup>3</sup>. In that year tea smallholdings in Assam occupied 22.7 per cent of the total 299,502 hectares under tea (Tea Board, Guwahati, 2009). A recent survey conducted by Industries and Commerce Department, Government of Assam (2011) indicates the number of tea smallholdings at 68,459 hectares with plantations area of 48,426 hectares. Since 1999 onwards the surveillance system of Tea Board of India had started to include the acreages under smallholdings, but the data were amalgamated with overall acreages under tea. The result is that we see significant rise in tea acreages under the estate sector of Assam (230,978 ha in 1998 to 257,735 ha in 1999, 299,502 ha in 2005 and 311,822 ha in 2006). Leaving aside the holdings of less than 10.1 hectares in size, acreages under estate sector tea plantations stood at 231,591 ha in 2005 and 231,277 ha in 2006 in the state. All reveal that the rise in tea acreages in the state is largely because of the rise in tea smallholdings and the area under estate sector has shown stagnancy.

Now the issue is to what extent the smallholdings fill the space left open by the estate sector and usher in the tea economy with its new

plantation led high productivity (Das, 2012 a). The context and space the tea smallholders of Assam are now placed, however, are not congenial to place smallholdings a dominant production mode in the tea sector. Issues on infrastructural constraints at processing level of green tea leaves and forwarding the final product to market are occasionally raised, but data in public domain are not available to have a clear understanding on infrastructural deficiencies and assess the wastage level of the primary produce.

This paper, drawing from a primary field survey, tries to assess the adequacy of infrastructures at the processing level to accommodate the production boom contributed by the tea smallholding sector. Moreover, on energy front, an assessment is made to understand how erratic supply of electricity puts constraints on operation of the tea factories to accommodate the supplies made by the tea smallholders. In addition to these two factors an assessment is made on highly oscillating and unacceptable prices of green tea leaves during the year in the smallholding sector, which indicates infrastructure deficiency as well as absence of regulatory provisions to ensure a fair price. On the tea smallholders' front it is inferred that the prices received for the green tea leaves influence investment decisions in their holdings. Overall the paper observes that inadequacy of infrastructures at the processing level and absence of a mechanism to ensure fair return to the tea smallholders have a bearing on the performance, influencing competitiveness of the sector.

## **II. Crisis: Overproduction or Deficiency in Processing Infrastructure?**

The tea smallholders of Assam at present are in crisis. The crisis primarily is about the anxiety and uncertainty over the prices they receive for green tea leaves. The smallholders having no processing factories of their own, and hence depend entirely on the large estates and bought leaf tea factories (BLTFs)<sup>4</sup> to sell their output. The deceleration of price of green tea leaves was so fast during 2011 season<sup>5</sup> that the price offered by the tea factories had come down from Rs. 21 a kg in August 2011 to

Rs. 3 in October 2011. Such phenomenon raises the issue of distributive justice considering the fact that in the retail market of tea we do not see high oscillations of prices. This issue created uproar and protest among the tea smallholders and demanded state intervention for a mechanism that ensures a fair price for the green leaves<sup>6</sup>. The form of protest registered was so anguished that on October 15, 2011 the smallholders had thrown 10 lakh kg of tea leaves on the highways<sup>7</sup>.

This is not that for the first time the tea smallholders faced crisis over the uncertain and undetermined prices. The history of the crisis could be traced back to the beginning of 21<sup>st</sup> century, with periodic return of low, which has no linkages to the country's or region's tea market price<sup>8</sup>. Analysis of dairies of a group of smallholders reveal that the year 2011 had hit low in prices of green tea leaves compared to the two previous years, that too with more oscillations (figure 1). The lows having no linkages with the auction market prices of tea would mean that the smallholders have little bargaining power. This issue, however, requires in depth investigation. On the other hand the rising number of supply days and quantum of supply made by the smallholders indicate that 2011 was a better year production wise (figure 2), which certainly influenced the fall in the price of green tea leaves (Table 1). Overall the crisis leads to two issues. Expression of inability or unwillingness to purchase green tea leaves from the smallholders would mean that the processing factories have their limit to process. On the other hand, a meager price offered for the tea leaves would indicate that the processing factories take the advantage of abundant supply of this perishable product.

Tea leaves being a perishable product it is important to have a look at the capacity of the processing factories in the producing zones to accommodate the seasonal flush. Interaction with a tea leaf agent<sup>9</sup> in the Golaghat district of the state had revealed a few issues. In the month of August 2011 the agent was asked to limit the supply below 1000 kg of tea leaves a day. Price during that month declined to Rs. 12 a kg. It



indicates that the processing factory to which the agent supplies leaves (there are numbers of agents supplying green tea leaves to the factory) has limited processing capacity. In addition to this case, presence of other processing factories in the neighbouring areas would mean that a substantial proportion of the harvest goes wasted. This case opens up the need to have detailed interactions with the tea smallholders and tea leaf agents in few other districts of the state where the tea smallholdings have concentration, and ascertain the fact on wastages of tea leaves.

Overall, it may be anticipated that in the prime production locations of the state there is a mismatch between area under tea and seasonal boom with the capacity of processing factories (estate factories as well as in the BLTFs)<sup>10</sup>. The processing factories would take advantages in such situation (this is rightly so, as there is no significant variation in prices of made tea at auction or open retail market), but it is important to have a clear assessment on capacity of the existing processing factories to accommodate the flush<sup>11</sup>. This issue also has relevance as the tea sector of Assam needs to raise competitiveness and inclusiveness<sup>12</sup>.

**Table 1: Tea leaves market captured from dairies of a group of tea smallholders (N-10)**

	2009	2010	2011
Average days of supply of raw leaves in the year	93	104	126
Average supply of leaves kg	6137	6676	7701
Average price for a kg in the year	Rs. 14.8	Rs. 16.1	Rs. 13.9
SD	3.24	2.26	3.58
CV	0.218	0.140	0.260
Max price Rs.	20.5	20.5	21
Min price Rs.	9	10	8

\*Source: Primary survey- December, 2011; location of interaction – Golaghat district, Assam.

**Table 2: Tea leaves market captured from a dairy of tea leaf agent**

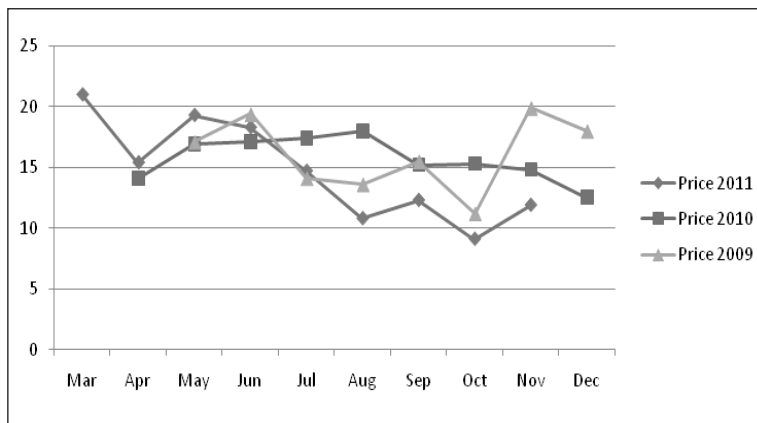
2011 season	Number of days supplied leaves	Total supply in kg	Average daily supply in kg	Price range in Rs. For a kg of leaves	Times price oscillated in the month
March	16	5754	360	16	0
April	20	6200	310	16-19	3
May	27	14480	536	16-23	7
June	26	18075	695	18-22	6
July	26	18525	713	13-19	7
August	25	18527	741	12-13	2
September	26	18155	698	13-14	3
October	21	16310	777	11-13	4
November	22	10890	495	12-15	2

\* *Source:* Primary survey- December, 2011; location of interaction – Golaghat district, Assam.

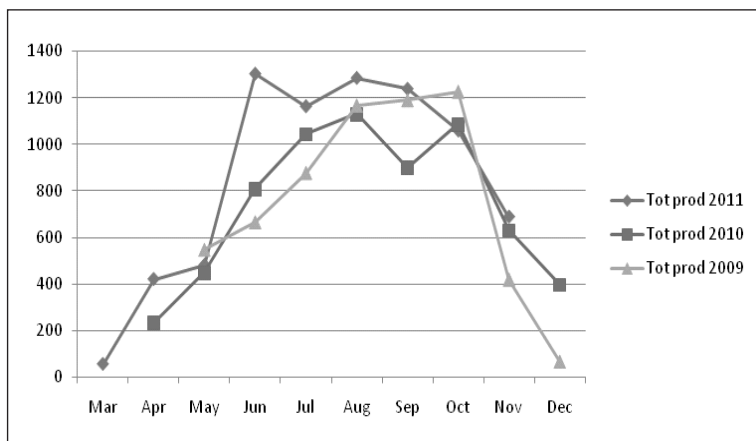
The dairy of a tea leaf agent reveals that price of tea leaves had oscillated 34 times during April, 2011 to November 2011 from a minimum of Rs. 11/ to maximum of Rs. 23/ (Table 2). It can be mentioned that the agent keeps Rs. 2.00 for a kg of tea leaves supplied to meet his transportation and handling costs. The variation of oscillation of prices of green tea leaves (CV 0.65) is much higher than the variations in the daily supply (CV 0.29). No reason is provided for variations in tea leaf prices offered by the processing factories. The uncertain prices of green tea leaves and the dependency syndrome of the smallholders on the large estate factories raise certain issues on distributive justice and sustaining the regime of the tea smallholders. A quick visit to a hub of tea smallholders (in Golaghat district) in 2011 had helped us to generate ample issues to explore the inherent constraints in the sector. A revisit in

few tea smallholders' pockets during December 2012 to January, 2013 had helped to raise few additional issues. In the following sections this paper details on some of these issues.

**Figure 1: Price trend of green tea leaf derived from dairies of tea smallholders (N-10)**



**Figure 2: Production trend of green tea leaf of smallholders (N-10)**



### III. Infrastructure and on Performance of the Tea Sector

Pricing of green tea leaves, reduced profit margins and the constraints associated with the field operations of smallholding plantations would explain only one part of limitation and incompetiveness. As indicated in Section I the issue of infrastructure deficiencies at the processing level has been raised now, the data is not available to indicate a clear understanding and picture on infrastructural deficiencies as well as assessment on wastage of the primary produce, leading to a rise in cost of production in the process.

Few newspapers reportage on erratic and inadequate power supply and bad road conditions to approach the tea plantations<sup>13</sup> are good enough to infer the situation. Tea Association of India reports that uncertain power supply and inadequate road connectivity increase the cost of output. This to a large extent affects competitiveness of the sector. Erratic power supply, which forces the plantations to rely on diesel, raises the cost of production (Poor infrastructure hits Barak valley tea units, Times of India, April, 30, 2012). Similar situation is also reported in all five major tea producing districts in Brahmaputra valley of the state; namely Dibrugarh, Tinsukia, Sibsagar, Jorhat and Golaghat. In these production hubs processing factories in about half of the tea estates run on gas supplies by Oil India Ltd. Frequent *bandhs* call by numerous organisations often affect the supply of gas, and even to restore the supply of gas the Assam Gas Company Ltd requires time to build the pressure in their pipelines. The result is that there is interruption in the production process. This reportedly forces many tea processing factories to stop buying green tea leaves from the smallholdings and even stop plucking leaves from their own plantations (Tea production in Assam affected due to non-supply of gas, Business Standard, June 2, 2012).

Data on public domain is not available on the loss of processing capacity by the tea factories due to unavailability of power. Moreover, some additional estimates would indicate the wastage of green tea leaves.

Information on quantity of tea leaves the factories declined to purchase from the tea smallholdings during the power crisis period and number of off-days of plucking (could be because of numerous reasons including unavailability of labour) in the smallholding plantations would indicate wastage of this perishable produce.

Along with the issue of power few additional evidences would indicate deficiencies of infrastructure in the tea sector. In the new plantations of tea smallholdings productively is high and the supply of green tea leaves has increased at the processing market. It is now obvious that, *over production* has induced a fall in price and subsequent crisis (Das, 2012 b). Tea leaves being a perishable product it is important to have a look at the capacity of the processing factories in producing zones to accommodate the seasonal flush<sup>14</sup>. Data generated by the baseline survey on tea smallholdings, conducted by the government of Assam (2011) are available at the website of Tea Board of India, north east zonal office. These data to a good extent help understand the capacity of the processing factories, their outturn and cost of manufacturing of tea. This paper tries to infer the situation using this data base. Government of Assam data however has not incorporated the issue on power infrastructure, which is a major determinant in functioning of the tea industry. It may be noted here that, CAG (2012) indicated cost on power and fuel including packaging account for 15.3 per cent of the total costs of producing one kg of tea.

#### **IV. Insights from Field Visits**

This paper tries to have an estimate on capacity utilisation of the BLTFs<sup>15</sup> and the proportion of underutilisation explained by the erratic power supply. A rise in the cost of production is anticipated due to the use of alternative and standby power system in the tea factories. In addition to this, there are evidences of wastages of green tea leaves because of inadequacy of processing infrastructure.

A primary survey was conducted to address the issues on infrastructure front. Information was collected from three sources - the BLTFs, tea leaf agents and the tea smallholders. The field survey tried to concentrate on the BLTFs and excluded the tea factories in the organised estate sector located within the large tea estates<sup>16</sup>.

A brief questionnaire was administered to the BLTFs to understand their processing capacity and production, power availability and operational hour utilisation, costs on power and fuel, processing capacity loss due to erratic power supply and provisioning of alternative power. Interaction with the tea leaf agents had helped to acquire information on their supplies to the factories, variations in supplies and oscillations of prices of green tea leaves. In addition to these the tea smallholders as well as the leaf agents mentioned certain operational problems in the production process and in supplying green tea leaves to the factories.

Visit to some production hubs of tea smallholders<sup>17</sup> has helped to examine their dairies and records on production and supply of tea leaves, the movement of prices of green tea leaves and problems related to operation and maintenance. The tea smallholders keep the records of the tea leaves plucked and sales in their registers and tiny dairies. As the tea smallholding sector does not have an organised surveillance system these registers and dairies to a great extent help to understand the trend, seasonal as well as yearly variations in production. Anticipation is that the level of adequacy/inadequacy of infrastructures in the tea sector-particularly those related to the smallholding sector has bearing on performance, influencing competitiveness of the sector.

### ***Bought leaf tea factories (BLTFs) set limit on the supply of green tea leaves***

Interaction with the tea leaf agents<sup>18</sup> revealed certain phenomena which are indicative that the tea sector of Assam is not performing to the optimum level and there are wastages. A question was raised to the tea

leaf agents whether the tea factories set a daily limit on their supplies in particular months?

**Box 1:** A tea leaf agent at Kamarbandha area in Golaghat district reported that the tea factory (BLTF) to which he supplies tea leaves had set a limit on his supply at 60,000 kg per month during June to October, 2012. As reported, the agent had the capacity to supply additional 6000 kg per month during that period and the BLTF did not buy tea leaves beyond the limit or quota specified to an agent. An agent at Marangi Chariali in Golaghat district supplies about 80,000 kg of tea leaves in a month and this is the upper limit set by the factory. The agent reported possibility of supplying additional 10,000 to 20,000 kg of leaves every month during June to October. Other agents of Marangi, Golaghat too reported about the limit set by the BLTFs. One of them was supplying 80,000 kg of leaves per month during June to October, reportedly had the possibility to supply additional quantity of 7000 to 10000 kg of tea leaves every month. Tea leaf agents at Biswanath Chariali in Sonitpur district reported possibility of supplying additional quantity of leaves during July (12,000 kg by each agent) and August (10,000 kg) in the year 2012. One smallholder, who has four acres of tea plantations at Kamarbandha of Golaghat district supplies 3800 kg of green tea leaves every month, reported possibility of additional supply of 700 kg per month.

The information presented in Box 1 is indicative that there are wastages of tea leaves; an additional 20 per cent of green tea leaves (a

rough estimate) could have been plucked and processed had the factories not set the limit in procurement. These indicate limitation of the tea processing factories on their processing capacity. The government of Assam (2011) data also gives an indication on accommodative capacity of the BLTFs to the production contributed by the smallholding plantations. Data shows that the BLTFs can accommodate 65.5 per cent of the total green leaves produced by the smallholders (Appendix Table 2). This table also indicates that the accommodative capacity of the BLTFs has no linkages or association with the price offered to the tea smallholders. For example the BLTFs of Dibrugarh district has accommodative capacity of about 94 per cent, to process the total green tea leaves supplied or produced by the smallholders in the district. On the other hand, accommodative capacity of BLTFs of Sibsagar district is just 20 per cent to the total green tea leaf supplied in the district. Still data (Government of Assam, 2011) indicates that tea factories of Sibsagar district paid a better price (Rs. 15/ for a kg of green tea leaves) to the smallholders than in Dibrugarh district (Rs. 13/). It may be noted that the tea factories located in the large plantation estates now procure 20 per cent of the total leaves produced by the tea smallholdings and procurement from smallholdings by the tea estate factories shows a rising trend (Appendix Table 3). Overall it can be commented that production boom in the smallholdings has created a mismatch with the processing capacity of the tea factories.

The limit set by the BLTFs has few repercussions. In addition to the possibility that a proportion of green tea leaves remain un-plucked or not plucked, the surplus leaves are sold to sub-agents or even to large agents at a very low price, who explore the possibilities to sell them at places wherever they have contacts<sup>19</sup>. The ultimate result is that a fair price for tea leaves is not ensured to the smallholders. This squeezes their margin of profit, which finally affect their capacity to invest in maintenance of their holdings. Field survey did not try to address this issue, but there is scope to investigate the impact of uncertain and low



prices on the maintenance and performance of the tea smallholding sector. The smallholders during the visits indicated that uncertainty on pricing front acts as disincentives to invest in their plantations. The consequences of this can be anticipated in the long run.

### ***Variation within the state- BLTFs and estates tea factories***

Some tea leaf agents, particularly in Sonitpur and Lakhimpur districts reported that estates factories do not set limit on supply of green tea leaves<sup>20</sup>. The tea leaf agents however reported irregular payment made by the factories as one of the major problems faced by them. Moreover, as reported the price of green tea leaves is determined by the factory, so smallholders and leaf agents are mere price takers leading to a kind of dependency syndrome in the tea smallholding sector. The tea leaf agents in Sonitpur district reported that during 2012 there was no surplus production in their locality<sup>21</sup>.

Some leaf agents have good relations with the estate tea factories. During the *Puja* holidays (October) these agents procure and buy all the excess tea from other leaf agents and sub-agents and supply to the estate factories. It is also found from the records (diaries) that this category of agents receives a uniform price for their supplies! This brings in an important issue for discussion on pricing front. Moreover, largely stable price of made tea during the year (2012) indicates that the tea factories are capable of ensuring a uniform and fair price for the green tea leaves supplied by the smallholders. This also brings the issue of implementation of the TMC0, 2003 regulations<sup>22</sup>.

### ***Spatial distribution/concentration of bought leaf tea factories***

Leaving aside the tea factories in the estate sector, consolidation and expansion of tea smallholdings in the state has provided enough incentives to the investors to set up the BLTFs in the tea producing areas of the state<sup>23</sup>. The BLTFs too have created a convenient place for the smallholders to sell their produces. There are 213 bought leaf factories

in the state (Tea Board, Guwahati<sup>24</sup>) producing about 140 million kg of made tea per year which is about 30 per cent of total production of the state (Economic Times, December 24, 2012). Data uploaded on the website of Tea Board, north east zone office however indicate presence of 177 BLTFs in Assam with production of 94.45 million kg of made tea (Data revealed for the year 2008). We here see some mismatch of the data made available on production front in the tea smallholdings.

Few questions arise on spatial distribution of BLTFs. Are the BLTFs uniformly distributed across the areas of tea smallholdings in the state? Data shows concentration of BLTFs in certain pockets of the state and this may have intensified competition to procure green tea leaves and the smallholders in the process compromise on quality of plucking! It is also likely that lack of factories in optimum numbers has lead to wastage of tea leaves in certain locations. In subsequent part of this paper some inferences are drawn on these issues.

It appears that government of Assam is concerned about intensification of unhealthy competition among the tea factories leading to deterioration of quality of the tea produced. There are 756 tea factories in the state, of which 527 are in the organised estate sector (as per this information 229 factories are BLTFs or in the unorganised sector!). For the last three years (2009-12), the state government had put a hold on the issue of fresh registration of the BLTFs as a quality control measure. Sources in Tea Board said: “The process of giving fresh registration has started recently. Factors like concentration of small tea growers, non availability of factories are considered while giving the no-objection certificate” (Assam to allow more bought leaf factories, Economic Times, December 24, 2012).

Would stringent criteria (on spatial distribution front) for setting up of the factories help? The state government was insisting on a detailed survey before giving permission to the new BLTFs. The state industry’s department has done an extensive survey on this and suggested certain

criteria for setting up the BLTFs. There is now decision to categorise the BLTFs into two groups – one comprising those who do not have their own plantations and the other comprising the ones having their own plantations of at least 100 acres of land. On an average, 500,000 kg of green tea leaves is produced on 100 acres of plantations in a year. Application of the second category of entrepreneurs, who have their own plantations of the above 100 acres, would get preference over those grouped in the first category. One of the important criteria proposed for this purpose is the availability of green leaf per BLTF should be at least 2,500,000 kg per annum<sup>25</sup> (Criteria for setting up bought leaf tea factories fixed, Assam Tribune June 1, 2011). The issue now is how all these conditions help the tea smallholders to sell their output at a right price? On efficiency front of the tea sector the second criterion of mandatory possession of 100 acres of own plantations by the BLTFs could help to ensure an uninterrupted production, as well as ensure an uniform quality of tea. It can be assumed that the criterion of possession of 100 acres of plantations by the factories was fixed on the assumption of prevalence of rampant competitions among the BLTFs to procure green tea leaves from the smallholders leading to deterioration of quality of plucked leaves. On pricing front of green tea leaves, however, this category of BLTFs would be in an advantageous position to bargain over the smallholders, unless stringent regulations on the pricing front are not implemented. Moreover, issues emerged from field interactions, that the BLTFs limit the supply of green tea leaves and data generated by the government of Assam (2011) survey indicate, the crisis is primarily due to abundant production in the tea smallholdings.

A look at the spatial distribution of BLTFs reveals that concentration is primarily in Tinsukia district (74 factories with 36.3 % production capacity of total the BLTFs in the state), Dibrugarh (41 factories with 46.9% production capacity), Golaghat (23 factories with 6.1% production capacity) and followed by Jorhat and in Sivasagar districts (Table 3). As indicated by the dataset of government of Assam

(2011), these 177 BLTFs manufactured 94.45 million kg of tea in 2008 (Appendix Table 1). It means that on an average a BLTF manufactures 533,593 kg of made tea. To make 94.45 million kg of made tea the BLTFs altogether purchased 453.9 million kg of green leaves during 2008; and to make a kg of made tea 4.8 kg of green tea leaves were used by the BLTFs. Contrary to this information the smallholders in Assam produced 391.5 million kg of green tea leaves in 2008. In this context some mismatch is observed on the dataset made available by government of Assam (2011).

Table 3 may make the picture clearer. Data of the survey conducted by the government of Assam (2011) reveals that processing capacity of the 177 BLTFs in Assam is 259.8 million kg of green leaves; whereas the production of the smallholdings in Assam stood at 391.5 million kg (in 2008). The survey data also indicates that the estate sector of tea plantations purchased 20 per cent of the total leaves produced in the smallholdings. Overall it indicates that 13 per cent of the total produce in the tea smallholdings remain unutilised and there is considerable spatial variation in surplus production (Table 3).

The data of government of Assam (2011) also give an indication on the accommodative capacity of the BLTFs to the production contributed by the smallholding plantations. The BLTFs can accommodate 65.5 per cent of the total green leaves produced by the tea smallholders (Appendix Table 2). There is however spatial variation in accommodative capacity. Overall it appears that the BLTFs cannot accommodate the production of tea smallholdings indicating the level of infrastructure deficiency in tea processing in the state.

Contrary to this there are reportages in newspapers about the cut-throat competition among BLTFs in an attempt to procure more tea leaves has hit production of quality tea in recent times. The Assam Bought Leaf Tea Manufacturers' Association had apprised the state

**Table 3: Surplus production of green tea leaves**

	BLTF	Capacity of BLTFs '000 kg	Production of small holdings in '000 kg	Surplus	Estate purchase* 20 % of total production	Overall surplus of green leaves	Surplus in %
Dibrugarh	41	121855 (46.9)	129859	8004	25971.8	-17967.8	-13.8
Golaghat	23	15850 (6.1)	35977	20127	7195.4	12931.6	35.9
Jorhat	16	11500 (4.4)	21689	10189	4337.8	5851.2	27.0
Karbi Anglong	5	1700	1680	-20	336	-356	-21.2
Nagaon	1	200	4667	4467	933.4	3533.6	75.7
Sivasagar	12	11100 (4.3)	54306	43206	10861.2	32344.8	59.6
Sonitpur	4	2900 (1.1)	6137	3237	1227.4	2009.6	32.7
Tinsukia	74	94248 (36.3)	133999	39751	26799.8	12951.2	9.7
Udalguri	1	490	3173	2683	634.6	2048.4	64.6
	177	259843	391487	131644	78297.4	53346.6	13.6

\* Source: Government of Assam, 2011.

government on this development. “setting up of new factories has resulted in demand for more green leaves and the rising demand has forced the small tea growers to pluck coarse leaves and this resulted in production of poor quality tea”, as stated by the chairman of the association, in a letter to state industries minister (Too many factories spoil brew-association plea for steps, The Telegraph, April 26, 2011). The apprehension from the state side too is that there has been a shortage of green tea leaves and with the establishment of new factories, the demand for green tea leaves has increased manifold. This has reportedly encouraged the tea smallholders to go for rampant plucking and supply coarse tea leaves to meet the growing demand. The price trend of tea leaves, extracted from the diaries of smallholders however reveals an altogether different scenario. In addition to this, government of Assam (2011) data generates ample issues which would require serious attention on infrastructure front.

Along with the BLTFs, several big tea companies possessing large estate plantations are now buying green tea leaves from smallholders (Banerjee, 2012). The procurement made by the estate sector now shows a rising trend in a bid to produce more tea at a low cost and remain competitive in the market (Appendix Table 3).

### ***Infrastructure deficiency and prices***

This section argues that a fair pricing mechanism of green tea leaves for the tea smallholders could have enhanced efficiency and investments in the tea sector.

Section II of this paper had mentioned about high oscillations and uncertain of prices of green tea leaves that loom large over the tea smallholding sector of Assam. The year 2012, also saw fall in the prices of green tea leaves from Rs 22 per kg in August to Rs 8/10 per kg in September, in most of the tea producing areas, having concentration of tea smallholders (Tea Board meet to address price fall, The Telegraph,

28 September, 2012; also see table 4). The smallholders allege that green leaf buyers (the BLTFs and organised tea estates) have been creating a monopoly and artificially bringing down the prices. The allegation is that the green leaf buyers are not following the price-sharing mechanism as envisaged in the TMCO, 2003 and as directed by the government of Assam.

Data shows that the average price realised by each registered manufactures at the auction market varies significantly. Seasonal average price for the year 2012 at Guwahati auction was Rs. 130.4 with a maximum of Rs. 227.2 and minimum of Rs. 86.0. There emerges argument what auction price (weekly or monthly) one should accept in determination of the price of green tea leaves. Moreover, the auction price realised by the registered manufactures varies, which would lead to multiplicity of prices received by the smallholders in different locations. The stated clause in TMCO, 2003 'the reasonable price for the green tea leaves according to the price sharing formula shall be determined taking into account the sale proceeds received by the registered manufacturer', would lead to multiplicity of price of green tea leaves and price could range from Rs. 12.4 to 34.3 for a kg<sup>26</sup>.

Time series data indicate that the average price of made-tea had not fallen in the tea auction market to the extent that it could cause such a low in the price of green tea leaves. Argument here is that non implementation of TMCO, 2003 leads to high variation in pricing, which acts as disincentive to maintain plantations (applications of fertiliser and pest control; and making investments in infrastructure such as on irrigation) ultimately leading to inefficiency in the production spaces. Field survey, however, finds regional variations in the prices received by the smallholders and in a few pockets the smallholders receive fair prices.

During December 2012 to January 2013, visit was made to altogether 27 tea smallholders. Among the 27 smallholders, 12 were in

Golaghat district, supplying tea leaves to BLTFs, mostly through the agents. The smallholders in Sonitpur and Lakhimpur districts (altogether 15 in our sample) directly supplied leaves to estate factories (these two districts have lower concentration of BLTFs- Appendix Table 1). It has emerged that the smallholders in Sonitpur and Lakhimpur districts supplying tea leaves to the estate factories are receiving better prices (average of minimums stood at Rs. 20.7 during March – November, 2012, Table 5) compared to the smallholders in Golaghat district (average of minimums stood at Rs. 17.5 during 2012, Table 6) who supply leaves to BLTFs<sup>27</sup>. The lowest average price received by the tea smallholders supplying leaves to estate factories was Rs. 18.9 in August, 2012 (Highest being Rs. 22.1 during March to May<sup>28</sup>). On the other hand the lowest average price received by the tea smallholders supplying leaves to BLTFs was Rs. 13.5 per kg in September, 2012 (Highest minimum average being Rs. 21.8 in March 2012).

Moreover, the price range of maximums and as minimums is also higher in case of supplies to the BLTFs (Tables 5 and 6). The price received by the smallholders supplying to the BLTFs ranged from Rs. 12 a kg to Rs. 24 a kg (a difference of Rs. 12); whereas the price range was lower (Rs. 16.6 a kg to Rs. 23 a kg, a difference of Rs. 6.4) in case to the supplies made to estate factories.

Appendix Table 2 indicates the average leaf price received by the tea smallholders from BLTFs. Comparison of the two tables (Table 6 and Appendix Table 2), shows some improvement in the price received by the smallholders (minimum average of Rs. 17.5 in 2012 from Rs. 11 in 2008), in Golaghat district; though the price range (Rs. 12 - Rs. 24) is still slender to the estimated range of Rs. 12.4 per kg to 34.3 for a kg (linking this to the auction market price and the price sharing formula).



**Table 4: Prices for tea leaves received by the smallholders, 2012, (N-27)**

	Average Maximum Price in Rs.	Average Minimum Price in Rs	Price Range of maximums Rs.	Difference in Rs.	Price Range of minimums in Rs.	Difference in Rs.
March	22.3	22.0	21.0 – <b>24.0</b>	3.0	18.0 – 23.0	5.0
April	21.5	20.7	18.0 – 23.0	5.0	18.0 – 23.0	5.0
May	21.9	20.8	19.0 - 23.5	4.5	18.0 - 23.0	5.0
June	22.5	20.0	20.8 - 24.5	3.7	16.5 - 22.5	6.0
July	20.1	19.3	17.8 - 22.5	4.7	16.5 - 22.4	5.9
August	19.4	17.9	16.8 - 22.3	5.5	15.0 - 21.8	6.8
September	18.3	<b>16.7</b>	15.0 – 22.0	7.0	<b>12.0</b> – 21.6	9.6
October	18.3	17.4	14.0 - 21.6	7.6	14.0 - 21.6	7.6
November	20.2	19.1	17.0 – 22.0	5.0	13.0 – 21.0	8.0
Average	20.5	<b>19.2</b>	14.0 – 24.0	10.0	12.0 – 21.5	<b>9.5</b>

**Table 5: Prices for tea leaves received by the smallholders from estate factories, 2012, (N-15)**

	Average Maximum Price in Rs.	Average Minimum Price in Rs.	Price Range of maximums Rs	Difference in Rs.	Price Range of minimums in Rs.	Difference in Rs.
March	22.2	22.1	21.0 – <b>23.0</b>	2.0	21.0 – <b>23.0</b>	2.0
April	22.2	22.1	21.0 – 23.0	2.0	21.0 – 23.0	2.0
May	22.1	22.1	21.0 - 23.0	2.0	21.0 - 23.0	2.0
June	21.5	21.4	20.8 - 20.8	0.0	20.5 – 20.8	0.3
July	20.3	20.2	17.8 - 22.5	4.7	17.8 – 22.4	4.4
August	19.1	<b>18.9</b>	<b>16.8</b> - 22.3	<b>5.5</b>	<b>16.6</b> – 21.8	4.6
September	19.4	19.3	17.3 - 22.0	4.7	17.2 – 21.6	4.4
October	20.1	20.0	17.8 - 21.6	3.8	17.8 – 21.0	3.2
November	20.7	20.6	18.3 – 21.6	3.3	18.3 – 21.5	3.3
Average	20.8	20.7	16.8 - 23.0	7.2	16.6 - 23.0	7.4

**Table 6: Prices for tea leaves received by the tea smallholders from the BLTFs, 2012, (N-12)**

	Average Maximum Price in Rs.	Average Minimum Price in Rs.	Price Range of maximums Rs.	Difference in Rs.	Price Range of minimums in Rs.	Difference in Rs.
March	22.5	21.8	21.0- 24.0	3.0	18.0 – 23.0	5.0
April	20.6	19.0	18.0 - 23.0	5.0	18.0 – 21.0	3.0
May	21.7	19.2	19.0 – 23.5	4.5	18.0 – 20.5	2.5
June	23.8	18.2	22.5 – 24.5	2.0	16.5 – 22.5	6.0
July	19.8	18.3	18.0 – 20.5	2.5	16.5 – 20.0	3.5
August	19.8	16.5	18.0 – 20.5	2.5	15.0 – 18.0	3.0
September	17.0	<b>13.5</b>	15.0 – 18.5	3.5	<b>12.0 – 15.0</b>	3.0
October	16.0	14.2	14.0 – 17.0	3.0	13.0 – 16.0	3.0
November	19.7	17.2	17.0 – 22.0	5.0	16.0 – 20.0	4.0
Average price	20.1	<b>17.5</b>	<b>15.0-24.0</b>	<b>9.0</b>	12.0 – 23.0	<b>11.0</b>

\* Source: Field work, 2012-13.

### ***Crisis of labour supply***

Skilled surplus labour from the nearby tea estates<sup>29</sup> is one of the prime determinants<sup>30</sup> that have influenced expansion of tea smallholdings in Assam in certain locations, particularly in Upper Assam districts<sup>31</sup>. In recent times, however, the issue of labour crisis in the smallholding tea sector has come to the fore. Several factors could explain the decline in labour supply in this unorganised sector. Field survey for this paper did not incorporate the issue on labour. Still, it can be inferred that the emerging economy has created opportunities in certain sectors (transportation, construction as well as opportunities offered by the flagships development programmes of the State) and relative high wages in these sectors have pulled the youth from plantation workers' community<sup>32</sup>. Moreover, studies now have indicated that the organised estate sector tea plantations despite being under the domain of PLA, 1951 has failed to ensure a fair labour standard<sup>33</sup>. The condition of workers engaged in the smallholding sector, which does not come under labour regulations in such context cannot be assumed better. The workers in the tea smallholding get themselves engaged just to supplement their household income. It is now evident that the tea smallholdings thrive on sheer flexibility of labour front and most of the workers are called to clear the seasonal flush and very few are employed on a regular basis.

During the field visits the tea smallholders in the districts of Sonitpur, Lakhimpur and Golaghat reported scarcity of labour to work in their holdings. Labour shortage affects timely plucking of leaves and late and untimely plucking affects the quality. The quantum of leaves remain unplucked or quality of plucks deteriorated due to the labour factor is in an unexplored issues in the tea sector<sup>34</sup>. This could explain a part of incompetitiveness in the sector.

### ***Quality issue of the leaves plucked by the tea smallholders***

An issue that the tea smallholders do not maintain the quality of tea leaf plucked is often raised in the tea sector of Assam. Few leaf agents

in Sonitpur district reported that tea factories maintain stringent quality control on the tea leaves supplied. Leaf agents reported incidences of rejection of the supply made by them to the tea factories.

Sanjib Ghimire in Bedeti, Sonitpur district reported that tea factories maintain stringent quality control on the tea leaves supplied. Reportedly the tea factory to which Mr. Ghimire supplies leaves had rejected 225 kg leaf supplied by him during 2012. This was also reported by Manoj Phukan of Ajoha Dhemaji that estate factory rejected 120 kg of leaves supplied by him in 2012.

In the areas where the smallholdings have boomed there are now rising numbers of leaf agents. There is scope to argue that rising number of agents generates intense competition to procure tea leaves from the smallholders and this may be a factor of poor quality plucking! As indicated earlier labour shortage is also an explanation of poor quality plucking. It may be also argued that the prices received for green tea leaves are not enough to ensure a fair return for the workers' effort, which subsequently affect the quality of tea plucked.

### ***Bad roads and rising cost of transportation of green tea leaves***

Bad road communication is one of the major problems faced by tea leaf agents. Tea leaf agents in Lakimpur and Dhemaji districts (these two districts are severely flood affected) reported rise in transport costs of tea leaves from the smallholdings to the factories, particularly during the monsoon floods. It may indicate that the agents raise the share of rising costs of transportation from the tea smallholders.

### ***The case of irrigation***

During the field visits the tea smallholders raised the issue of water supply and irrigation in their holdings. Recent times the state of Assam has seen high seasonal variability in weather and rainfall<sup>35</sup>. The

smallholders mentioned that productivity of their plantations could have been raised further with the provision of irrigation. It is also inferred from the discussion that uncertain pricing of green tea leaves negatively influence smallholders' investment decisions on irrigation. Moreover, ground water quality (high iron contents in tube wells) has influenced the quality of water sprinkled in the smallholdings. Some smallholders consider drawing water from nearby rivers as a solution. But it will require substantial investments. The approaches of Tea Board of India reflect that the Board has understood this issue very well. The irregularity in the monsoon (both in terms of lack of adequate rainfall and prolonged dry spell) is forcing the tea industry to invest on irrigation infrastructure. Moreover, large scale replanting along with the expansion of smallholding plantations would bring large area under young bushes and these new plantations require much more water supply than the older bushes. Tea Board of India focuses this aspect in the XII Plan period (Outcome budget, Tea Board of India, 2012-13). Currently the irrigation subsidy is being offered at 25 per cent of the total expenditure subject to a maximum of Rs. 10,000 per hectare. Moreover, the total expenditure per garden is also capped at a maximum of Rs. 10 lakhs. Considering the current cost of creating conventional irrigation facility (estimated to be around Rs. 70,000 per hectare), this ceiling is considered too low. Moreover many tea estates are now willing to go for large scale investments in irrigation covering more than 100 hectares of area at one time. Tea Board of India also proposes to provide interest subsidy @5% annually for seven years on the 50 per cent of the planting cost availed as loan from banks. Tea Plantation Development Scheme (XI Plan period) of Tea Board of India earlier had made certain items – sprinkler equipment, drip irrigation system, pipelines, motors, pump sets with electric line connection and accessories and creation of irrigation sources such as check dams, tube wells etc. were eligible for subsidy for creation of irrigation facilities. In creation of irrigation infrastructures the smallholders, however, would face certain constraints. As indicated

earlier, the costs involved in creation of irrigation infrastructure is high; and only with regulatory supports on pricing front of green tea leaves the smallholders would get incentives to invest. Moreover, most of the tea smallholdings are not located in continuous patches. Collective investments in such context will require spatial planning, and for this formation of smallholders' association at village level would help.

## **V. Impact of Unreliable Power Supply on Tea Factories**

There are studies across the world revealing rising costs of production and incompetitiveness caused by inadequate provisioning of public infrastructures. These studies provide insights to understand and address the constraints of the tea sector.

Energy infrastructure meaningfully explains why some countries have managed to industrialise while others have been less successful (Isaksson, 2009). Isaksson (2009) finds that the impact of adequate energy infrastructure is greatest for the poorest economies and offers an explanation for differentiated industrial growth rates. Isaksson (2009) further tells that while erratic supplies of electricity disrupt production, voltage fluctuations negatively affect the durability of machines. Better electricity-related infrastructure can, thus, raise the efficiency and durability of physical capital and create a multiplier effect in the progress of an economy. According to the World Bank's investment climate assessments, 55 per cent of survey respondents in Latin America and the Caribbean considered infrastructure to be a major or severe obstacle to the operations and growth of their business (Andres *et al*, 2008). Moreover, problems with electricity and transport services especially deter foreign direct investment and export participation.

Adenikinju (2005) analysed the cost of power outages to the business sector of the Nigerian economy and finds that the poor state of electricity supply has imposed significant costs on its business sector. The bulk of these costs come in the form of acquisition of very expensive

backup power - where firms spend as much as 20 to 30 percent of initial investment on the acquisition of facilities to enhance electricity supply and reliability, has a significant negative impact on the cost competitiveness of the manufacturing sector. However, the decision to acquire a backup is actually a rational decision on the part of the firm in order to insure it from larger losses arising from frequent and long power fluctuations. Furthermore, as the results show the small-scale operators are more heavily affected by the infrastructure failures because of the affordability factor. Foster and Steinbuks (2009) in African context show that unreliable public power supplies is far from being the only or even the largest factor driving generator ownership. Firm characteristics have a major influence, and, in particular, the probability owning a generator doubles in large firms relative to small ones. Overall, own generation by the firms - which has been on the rise in recent years - accounts for about 6 percent of installed generation capacity in Sub-Saharan Africa (equivalent to at least 4,000 MW of installed capacity). However, this share doubles to around 12 percent in the low-income countries of Sub-Saharan Africa. The costs of own generation, driven mainly by the variable cost of diesel is about three times as high as the price of purchasing (subsidised) electricity from the public grid.

Fernandes and Pakes (2008) in Indian context show that firms which suffer more production losses due to electricity outages are less productive within their states and underutilise both labour and capital more than firms in states with less production losses due to electricity outages. Fernandes and Pakes (2008) study further finds that the extent of underutilisation of labour differs substantially across Indian states. In particular, states with higher GDP per capita (so better infrastructure) exhibit much less underutilisation of labour. These insights help to draw indication that power infrastructure has significant role to usher inclusive growth and ensure distributive justice. This factor is of much relevance in context of tea smallholding sector<sup>36</sup>.



### ***Power crisis and the cost of tea processing***

Assam at present is experiencing an average peak power demand of 1100 MW. This is more than two times what it was five years back. Since no power generation project is commissioned in recent times the gap of demand and supply is widening. Total availability of power in the state is around 800 MW of which 540 MW is allocation of central sector power generating station (CSGS) and 260 MW is from own generation of the state<sup>37</sup>.

Visit was made to 11 BLTFs in three tea smallholders' hubs - Dibrugarh, Golaghat and Sonitpur districts of the state. Objective was to have an assessment on power supply scenario and its effects in the production process.

The BLTFs, on an average, operate nine months during the year, from March to November<sup>38</sup>. As reported the BLTFs run 13-14 hours a day. The BLTFs largely rely on electric power supplied by the Assam Power Distribution Company Ltd (APDCL) to process the green tea leaves. All the BLTFs reported irregular supply of electricity and load shedding for an average of six hours during the day; from a minimum of 4 hours to 12 hours in the sampled factories (Table 7). It was also reported that the situation of power availability gets worsened during the summer. As the tea factories cannot afford to lose operational hours, all of them have made provision for alternative power in diesel generation sets<sup>39</sup>. It is estimated from the sample that 42 per cent of operational hours are lost due to unavailability of electricity which is supplemented by power generated from diesel generation sets.

Alternative arrangement of power made by the BLTFs has helped to accommodate all the tea leaves supplied and purchased<sup>40</sup> for processing and there is no reported wastage. However, there arise a few negative externalities due to frequent power cuts during the day. As reported by the management of the tea factories, the quality of the made

tea gets affected due to frequent breakdowns in the power supply. Moreover, frequent switching to alternative power sources consume time and the result is that the factories need to be run for additional hours during the day to clear the stocks. It thus raises the cost on labour<sup>41</sup>.

A rough estimate on the rising cost of production is made due to use of alternative power and fuel. The estimated average recurring cost incurred only on the use of electric power for production of a kg of made tea is Rs. 4.9/ in the 11 sampled BLTFs. Recurring cost to make a kg of made tea using alternative power (diesel) is estimated at Rs. 6.1 (Table 7). It requires a detailed study to have a precise estimate on the rise of operational costs due to irregular and interrupted power supply. A rough estimate from the data derived from the sample BLTFs indicate about 10 per cent rise in cost of fuel or power in the production process.

The size of the sampled BLTFs varies with processing capacity of 4000 kg to 50000 kg green tea leaves a day (average 25300 kg). The samples factories on an average produce 4790 kg of made tea a day, from a minimum of 800 kg to maximum 7500 kg. The factories run average 235 days a year (minimum 200 to maximum 330 days) (Table 7).

Some narration on the tea factories would help us to understand the power crisis situation better. Sonaguri tea factory at Morongi in Golaghat district of Assam runs 70 per cent of its operational hours based on electric power supplied by the APDCL. The factory which processes 33000 kg of green tea leaves a day requires 35 liters of diesel to run its backup power generation sets for an hour. In particular days, because of frequent power cuts and to accommodate the flushes, consumption of diesel shoots up to 800 liters a day. Moreover, the factory keeps three engineers to look after the machineries and the diesel powered generation sets. Premier tea factory in Golaghat district needs 120 liters of diesel every day. Since all factories have made source of alternative power through diesel generation sets there is no wastages of tea leaves at processing level except that a rise in cost of production. It overall

**Table 7: Summary statistics: bought leaf tea factories (N-11)**

	Average	Max	Min	SD
Green leaves processed, kg/day	25273	50000	4000	12362
Production dry tea, kg/day	4790	7500	800	2197
Kg of Green leaf used to produce a kg of dry tea	5.3	8.3	4.5	1.2
Factory runs, hours/day	13.6	24	8	4.2
Factory runs, days/year	235	330	200	41.3
Monthly production dry tea	119761	187500	20000	54916
Factory run by electricity, hours/day	7.9	11.3	4	2.3
Factory run by diesel gen set, hours/day#	5.7	12.7	4	2.7
Factory operation hours by electricity in %	58.1	75.4	47.1	9.8
Monthly Electricity bill/Rs.	316140	700000	65000	162958
Monthly diesel cost/Rs.	282054	1172000	97778	304632
Cost electricity per kg tea/Rs.	4.9	7.9	2.8	1.7
Cost diesel per kg tea/Rs.	6.1	12.3	2.3	3.7
Production cost of power/Rs	5.3	10.0	3.3	2.2

\* Source: Field Work, 2012-13; # This row also indicates hours electricity not available.

indicates that opportunity costs of not keeping alternative power backup is higher than a rise in cost of production using diesel as source of fuel; findings which are similar to Adenikinju (2005).

## **VI. Conclusion: Institutions and Regulations to Ensure Coherence and Competitiveness**

It has appeared that in the tea smallholding sector of Assam there is mismatch of production of green tea leaves and the processing capacity of the factories to accommodate the flush. Challenges for the State (or Tea Board of India) are now to regulate the distortion in the market of green tea leaves in certain locations of the state. In Sri Lanka's context such distortion to a large extent is addressed. Three major reasons are cited for the success of Sri Lanka tea smallholding sector to regulate and correct the distortion. One, geographical compactness of the tea sector and proximity to the processing factories; two, efficiency and inclusiveness of the Colombo auction system, which accounts for 96 per cent of total sale and three, presence of a coherent institution (the Tea Smallholders Development Authority) with adequate manpower to address the need of the smallholders (Banerjee, 2012). Considering these contexts it can be said that the tea smallholdings of Assam are yet to take a coherent form.

The baseline survey on tea smallholdings conducted by the government of Assam (2011) has indicated deficits in processing infrastructures (Appendix Table 2). This issue requires further assessments including establishment of a supply network considering the connectivity factors. In this context the newly established directorate of tea smallholdings, which is located in Assam, could facilitate steps for corrective measures. The review of sales through the Gauhati Tea Auction Centre (GTAC) now see disheartening scenario and rising quantum of sale of made tea now is through private mode. Hazarika (nd) indicates certain constraints (windfall at brokerage level, which does not ensure a fair return to the tea producers) to sell tea through the

auction market and realisation of poor prices<sup>42</sup>. All have repercussions on the tea manufactures as well as on the smallholders, and call for corrective measures. Establishment of a mechanism to fix and ensure a fair price of green tea leaves is now the call of the hour. It is inferred from the field that a fair price of green tea leaves to a large extent determines the decision on plucking and investments (particularly in maintenance) in the tea smallholdings.

On the infrastructural front, adequate public provisioning would help to reduce the cost of production and enhance competitiveness and inclusiveness of the tea sector, particularly of the smallholding sector. Arrangement of alternative power no doubt has prevented the wastage level of green tea leaves. But it has raised the cost on fuel by 10 per cent in our sample tea factories. Moreover, the energy used (diesel) in this process is not environmentally friendly. In addition to this, there is reported to be high consumption of energy in the processing factories because of inefficiency in the use and outdated machineries<sup>43</sup> (Banerjee, 2012).

The Tea Board of India has proposed an outlay of Rs 316 crores for tea smallholders' development scheme in the 12th five Year Plan. The underlying objective is to help smallholders to become more organised so that they do not become vulnerable to the more powerful intermediaries and factories. Tea Board of India is aware of smallholders' inability to influence price, unscientific practices in agricultural operations and absence of adequate number of processing units in their vicinity (Outcome Budget, Tea Board of India- [www.teaboard.gov.in](http://www.teaboard.gov.in)). Such initiatives reflect realisation on the part of the State and Tea Board of India that there is deficiency or mismatch of tea processing infrastructure along with a regulatory support system to ensure fair price for green tea leaves<sup>44</sup>.

Tea Board of India has also realised the need for micro-irrigation scheme for the smallholders and need of financial support for such

schemes and on machineries. “The above scheme should also be available to self-help groups having contiguous areas that can be brought under the coverage of common irrigation facilities<sup>45</sup>”. Moreover, the new directorate for the tea smallholders has made a provision for one development officer for every 3,000 smallholders and one factory advisory officer for every 25 BLTFs. It is understandable that such complementary provisioning would help enhancing the competitiveness of the smallholding as well as of the tea sector as a whole.

Government of Assam, in January 2011 had announced a policy named ‘Cess<sup>46</sup> Utilisation Policy for Development and Welfare of Small Tea Growers of Assam, 2010’ to provide infrastructure for setting up green leaf collection and auction Centres, assistance to STGs/SHGs to set up small orthodox/CTC factory (Tea Board, Guwahati, [www.teaboardguwahati.com/stg.pdf](http://www.teaboardguwahati.com/stg.pdf) accessed on 4<sup>th</sup> March 2011). There are some proposed initiatives to address infrastructural issues in the smallholdings. All approaches however need to be holistic to address the problems faced by the sector effectively.

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**Notes**

1. To ensure productivity of the tea plantations age old plantations needs to be replaced by re-plantations. The yearly required norm of re-plantations is two percent of the total tea acreages, which was never followed in practice in Assam tea estates. Data shows that on an average just about 0.5 tea acreages gets replanted every year. In Assam about 37 percent tea acreages are more than 50 years old (Government of Assam, 2010).
2. The estate sector plantations of Assam follows a system of payment to the workers which is somewhat wage as well as output contract. To get the stipulated daily wage a worker needs to pluck a minimum quantum of 23 kg of leaves. Labour demand as well as fulfillment of minimum plucking task requires maintaining of certain level of uniform productivity over all the extent of the plantations. This ensures optimum work for the workers. Along with field productivity, slope of plantations and weather also influence productivity of the workers. Unlike the contract mode of deployment, in the context of regular deployment of the workers in the estate sector, low productivity lead to underutilisation of workers and higher cost of production in this labour intensive sector.
3. Tea Board of from 2005 onwards has started to indicate areas under smallholdings separately. This is the reason that we do not see segregated data on acreages under smallholdings of earlier years.
4. Most of the tea processing factories in Assam are located in large plantation estates. In past one decade there has been emergence of bought leaf tea processing factories in private initiatives.
5. A look at the 2012 prices of green tea leaves (field visit information) however did not reveal low compared to the year 2011. The smallholders reported decline in flushes and production in 2012 because of rainfall variability in the state. In the entire debate on crisis in tea smallholding, the weather and climate factors too deserve attention.
6. The Ministry of Commerce and Industry, Government of India had initiated a step towards ensuring a fair price for raw tea leaves by forcing the Tea (Marketing) Control Order, 2003. The tea smallholders association in the state feels that the TMCO, 2003 lacks the punch of an Act and skeptical about its probable impacts (Small tea growers threaten agitation over TMCO, Business Standard, November 24, 2011; Tea growers not hopeful of recovery of falling price of leaves, Times News Network, November 28, 2011).
7. Most of the local newspapers in Assam reported this incidence on 16<sup>th</sup> October 2011.
8. Data on auction price of tea in Indian market show a rising trend over the years except in 2005. Average price of made tea in Indian auction market was Rs. 48 in 1995 which had increased to Rs. 105.6 in 2009. Month wise data for 2009 showed a low of Rs. 80 in February and a high of Rs. 119 in



May. Seasonal average price for the year 2012 at Guwahati auction stood at Rs. 130.4 with a maximum of Rs. 227.2 and minimum of Rs. 86.0.

9. The tea leaf agents create the link between the smallholders and the factories, both the BLTFs and estate factories. It is observed and learned that the suppliers play a vital role in placing the green tea leaves in the market produced by the smallholders, particularly by the tiny holders.
10. Contrary to this assumption, issue is also raised that emergence of BLTFs in large numbers has led to an unhealthy competition in procurement of green tea leaves in the smallholders' hubs. This reportedly is leading to deterioration of quality of green tea leaves. We will discuss this issue in later part of this paper.
11. Tea leaves in Assam flush in late March and early April with arrival of pre-monsoonal rain. Price offered by tea factories for green leaves is high during this period as there are limited supplies. Abundant flush of leaves during the monsoon (June-October) results in decline in prices offered (figure 1). The production and supply declines in the post monsoon period and virtually stops in December. Prices offered by factories declines at this phase for poor quality of flush of tea leaves. Most of the tea factories in the state close in December and reopens in March-April.
12. The present level of productivity of the estate sector tea plantations of Assam is not acceptable to ensure competitiveness in the market and the new plantation led productivity of the smallholdings have able set a norm or standard. Labour requirement and absorption (more labour will be required to pluck more as well as to maintain the plantations) is likely to be more in the highly productive smallholdings. This is feasible provided the pricing of green tea leaves is right enough to ensure enthusiasm of the smallholders and infrastructure is adequate to prevent any form of wastage.
13. Such reportages primary indicated at the organised estate plantations, but conditions equally apply to the tea smallholdings as well as for the BLTFs.
14. This would be a stupendous task to capture information on processing factories. The Tea (Marketing) Control Order, 2003 guidelines however could help to improve the surveillance system. It is important to have information on quantity of leaf sourced from estates and smallholdings separately by the registered manufacturers and the capacity of the factories. A regulation, compelling each registered manufactures to submit the monthly return to the registering authority and state, would make it possible to have a concrete data base. These TMCO, 2003 guidelines are however not followed in practice.
15. The BLTFs in the state have emerged banking on the production boom ushered by the tea smallholdings. The smallholdings too depend on the BLTFs to a great extent. The proportion of green tea leaves bought by the BLTFs from smallholdings stood at 80 percent in 2009, GoA (2011).
16. This is because the smallholders largely depend on the BLTFs. The estate factories have their own plantations to cater their need, though in the large

estate factories too, the issue of deficiency in power supply is raised and discussed.

17. During December 2012 and January 2013, field survey was conducted in few pockets some of them were visited earlier in December 2011.
18. There are advantages as well as disadvantages of being dependent on tea leaf agents. There are competitions among the agents to procure leaves from the smallholders and in this context road conditions and inaccessibility take a backseat. In this process the price for green tea leaves received by the smallholders is less compared to the direct supply to the factories. Still the smallholders are in advantageous position that the agents collect the leaves from their holdings and relieve the smallholders to compromise with the bad roads; this also save their time and efforts. The leaves however need to be collected on time. The impact of delay in collection means that moisture in leaves gets evaporated leading to loss in weight and so the prices fetched.
19. The large plantations estates factories reportedly accommodate the surplus. Data show inefficiency in production and rise in costs in large plantation estates of Assam. The estates sector of tea now looks for relatively cheap procurement of green tea leaves from the smallholding plantations (considered as a mode of outsourcing) limiting expansion of own acreages largely to avoid the labour costs (Das, 2012 c).
20. In some tea producing hubs, particularly in north Assam districts of Sonitpur and Lakhimpur, do not have concentration of BLTFs. In these localities the tea leaves produced by the smallholders supplied to the estate factories (see the appendix table 1).
21. Variability in rainfall and weather now comes to forefront in performance of the tea sector. This will require an analysis on changing weather and climatology of the region. This also brings in the issue of creation of infrastructure on micro-irrigation for the tea smallholders.
22. The Tea (Marketing) Control Order, 2003 of Ministry of Commerce and Industry, Government of India has a clause on fixation of price sharing formula of raw tea leaves. It states that every registered manufacturer engaged in purchase of green tea leaves shall pay to the supplier a reasonable price according to the price sharing formula. This may be specified by the Registering Authority, from time to time and implemented in a manner as determined by the Registering Authority, with the prior approval of the Central Government. The reasonable price for the green tea leaves according to the price sharing formula shall be determined taking into account the sale proceeds received by the registered manufacturer. The TCMCO, 2003, however nowhere stated or indicated on what basis the price of tea for raw leaves would be shared. Word of mouth and vernacular newspapers of the state however indicate that 65 percent of the realised price from the sale of dry tea would go to the suppliers of raw tea leaves and 35 percent would be kept by the manufacturers.
23. The industrial policy of the state as well as the north east industrial policy, 1997 offer a host of subsidies and concessions to establish industrial units in

the region. There is capital investment subsidy of 30 percent to a ceiling of 25 lakhs for EoUs, there are interest subsidy on working capital and subsidy on power (see Das, 2012 d). It may be assumed that the BLTFs have utilised the provisions of the NEIP, 1997.

24. Information was extracted from [www.teaboardguwahati.com/stg.pdf](http://www.teaboardguwahati.com/stg.pdf), accessed on 4th March 2013. Tea Board data is based the first Survey Report and Data Bank on Small Tea Growers of Assam, conducted by the department of Industries, Government of Assam. The report was released on 13<sup>th</sup> January, 2011.
25. Survey of 11 sampled BLTFs in the state reveal that these factories process on an average 5,800,000 kg of green tea leaves during the year. Yearly processing capacities in the sampled factories ranged from 884,000 lakh kg to 10,000,000 lakh kg (Table 5).
26. In determining this price it is assumed that to prepare a kg of dry tea there is requirement of 4.5 kg of green tea leaves and production costs in the fields account for 65 percent costs of production. The ratio of made tea to green leaf is termed as “recovery percentage” alternatively, as “out turn”. This ratio varies depending on the initial moisture content of the leaf. Leaf with moisture content of about 83% during wet period produces 16.5 kg black tea from 100 kg of green leaf. Similarly, leaf with moisture content of 72% during dry period produces as much as 27.5 kg of tea from 100 kg of green leaf. Taking an average of 77-78% moisture for the whole season, 22.5 kg of made tea is expected from every 100 kg of green leaf (a note on withering tea manufacture- Tea Research Association, Toklai, Jorhat, [www.tocklai.net/TeaManufacture/withering.aspx](http://www.tocklai.net/TeaManufacture/withering.aspx) accessed on 13th December, 2011).
27. It may be noted that the tea leaf agents keep a margin for their efforts and services. This could be between Rs. 1 to 2 for a kg of leaves.
28. Pre-monsoon showers though lead to flushes of tea leaves, production reaches peak during the monsoon (June-October period). In the starting of the plucking season (March -April), there is demand from the factories to procure leaves and this result in higher prices.
29. Poor wages and casualisation of workforce in the estate sector plantations indicate unlimited supply of labour in the tea sector. However, it may be a myth to assume that the tea sector still attracts labour to work in the smallholdings, where jobs are intermittent and wages are meager.
30. Other determinants are abundance of uplands, suitable soil and climates, a convenient market to sale green tea leaves in estate factories etc.
31. See appendix Table 2.
32. In, India, the implementation of the National Rural Employment Guarantee Act (which guarantees one hundred days of wage-employment in a financial year to a rural household whose adult members volunteer to do unskilled manual work), has led to a shortage of casual labour in tea estates, hitting

smallholders the most. There is also a danger of lower productivity and poorer quality of leaf plucking (coarse plucking), which has an impact on price realisation (Banerjee, 2012).

33. There are few primary studies by North Eastern Social Research Centre (2004) and the National Campaigns for Labour Rights (1999) reveal that the tea sector of Assam lacks labour standard.
34. The quick survey did not visualise the emerging crisis of labour supply; but this issue has created space for further research.
35. A report on rainfall variations projected decline in overall the number of rainy days in Assam, but intensities would increase (INCCA Report, 2010). Time series data (1970-2010) analysis by Upadhyay (nd) on rainfall indicates annual variability in the state.
36. Joseph (2012) makes a point that the plantation sector of India is not just a foreign exchange earner but a 'key sector' in achieving inclusive development as envisioned in India's 11<sup>th</sup> and 12<sup>th</sup> five year plans. The sector's role comes to prominence in its contribution in employment generation, especially women (about 55 percent worker engaged in the tea sector are women), and a source of good income earning opportunities for the small and marginal holders.
37. For detail note on power supply situation see the website of APDCL-[www.apdcl.gov.in](http://www.apdcl.gov.in)
38. Tea leaves in Assam flush in late March and early April with arrival of pre-monsoonal rain. Production and supply declines in the post monsoon period and virtually stops in December. Most of the BLTFs in the state are closed in December and reopens in March. The factories get engaged in overhauling and maintenance during the closure.
39. The capacity of diesel powered generation sets vary in sampled factories – from 62.5 KVA to 320 KVA; some factories have installed multiple generation sets.
40. As mentioned earlier the BLTFs set a limit on the supplies made by the tea smallholders and tea leaf agents. The factories thus procure that much of quantity which they can afford to process.
41. The survey did not try to have an estimate on the cost of labour increased in this process. The situation was not visualised prior to the field visit that frequent switching to alternative power sources consumes time forcing the BLTFs to extend work hours.
42. Better price fetched by tea at auction market would help the smallholders, provided there is an institutional mechanism to share the prices fetched in the market and ensure the benefits.
43. A project for energy conservation in small sector tea processing units in South India was initiated by the Tea Board of India in 2008, supported by

the United Nations Development Programme (UNDP) - Global Environment Facility (GEF). The objective of the project is communication and awareness creation to the stake-holders for the procurement and adoption of energy efficient/renewable-energy equipments and their relation to their medium to long-term profitability.

44. To ensure fair price, government of Assam in 2011 had contemplated to introduce a bill to penalise tea factories defying the TMCO, 2003. The outcome is not known. The implementation of TMCO was proposed by the State Industries Minister from April 2012; we still do not see any concrete step in this regard. Apart from the issue of fair pricing of tea leaves, the smallholders now have raised the issue of availability of fertiliser and pesticides at fair price. Smallholders reported high incidences of pest attacks in their plantations. This issue however calls for provisioning of effective extensions services (from assessing soil quality and scientific mitigation of pests) to ensure productivity in the sector.
45. For a detailed note see Tea Plantation Development Scheme for the XI plan period, Tea Board of India, [teaboard.gov.in](http://teaboard.gov.in) accessed on 22<sup>nd</sup> April, 2013; and Goswami (2012).
46. It may be noted that tea smallholders pay Rs. 0.25/ as cess to the government of Assam for every kg of green tea leaves they produced.

**Appendix Table 1: Production of BLTFs and mode of their sales**

Districts	BLTFs	Tea Manufactured in 000 kg	Tea sold through auction	%	Tea sold through private	%	Tea sold through Retail	%
Tinsukia	74	42116	12021	28.5	25796	61.2	4299	10.2
Dibrugarh	41	21105	7793	36.9	13883	65.8	210	1.0
Golaghat	23	11881	4761	40.1	7797	65.6	0	0.0
Jorhat	16	8316	2482	29.8	3967	47.7		0.0
Sivasagar	12	8721	5523	63.3	1748	20.0	15	0.2
Karbi Anglong	5	289	616	213.1	229	79.2		0.0
Sonitpur	4	1986	1052	53.0	8	0.4	318	16.0
	175	94414	34248	36.3	53428	56.6	4842	5.1

**Appendix Table 2: Production in tea smallholdings and accommodative capacity of the BLTFs**

Name of the District	No of Tea small holders	Area under tea (acres)	Green leaf production (2008)	No. of BLTFs	Capacity of BLTF to process green leaf/ kg	Accommodative capacity of BLTF in %	Average price paid
KarbiAnglong	241	1258.67	1680479	5	1700000	101.2	12.00
Darrang	6	9.10	58900	-		-	-
Dhemaji	186	549.53	701621	-		-	-
Dhubri	4	16.57	26000	-		-	-
Dibrugarh	19160	28189.98	129858815	41	121855000	93.8	13.00
Kokrajhar	122	1465.25	2406554	-		-	-
Lakhimpur	482	1924.38	1894066	-		-	-
Nagaon	449	2372.14	4667402	1	200000	4.3	-
Udalguri	1093	6097.73	3173445	1	490000	15.4	19.00
Jorhat	5889	6113.00	21689010	16	11500000	53.0	14.00
Tinsukia	18595	33621.91	133998526	74	94248000	70.3	13.00
Golaghat	11286	16581.59	35977270	23	15850000	44.1	11.00
Sivsagar	9590	16354.71	54305797	12	11100000	20.4	15.00
Sonitpur	1356	5446.19	6136532	4	2900000	47.3	12.00
Total	68459	120000.75	396574417	177	259843000	65.5	13.63

**Appendix Table 3: Proportion of green leaf bought by the estates factories from tea smallholders**

	Estate factories	2000	2005	2009	Capacity utilisation of the factories		
					2000	2005	2009
Dibrugarh	117	16.0	25.8	26.5	51.9	53.3	59.0
Tinsukia	69	5.2	7.9	7.3	79.4	96.7	99.6
Sibasagar	71	15.2	17.4	30.7	63.5	118.2	96.3
Jorhat	42	19.5	19.5	24.8	24.2	30.8	33.7
Golaghat	46	16.0	30.1	22.5	57.5	55.7	74.7
Sonitpur	48	2.7	7.4	21.6	79.5	80.9	89.3
Lakhimpur	9	12.5	18.3	20.7	85.6	93.3	111.5
Udalguri	25	7.9	6.3	15.6	89.6	97.5	96.3
		10.6	15.4	20.3	60.8	72.3	75.5

\* Source: Government of Assam (2011).



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