CEC Working Paper

STUDY ON COST OF PRODUCTION, PRICING OF GREEN LEAF, AND THE RELATIONSHIP OF SMALL TEA GROWERS (STG) WITH BOUGHT-LEAF FACTORIES (BLF) AND AUCTION CENTRES

Abdul Hannan

2007

'Sustainable Livelihood for Small Tea Growers and Workers in India'

Centre for Education and Communication (CEC)
173-A, Khirki Village, Malviya Nagar, New Delhi – 110017
Ph: +91 11 2954 1858/ 1841/ 3084/ 2473
Fax: +91 11 2954 5442/ 2464
Email: cec@cec-india.org; **Web:** www.cec-india.org

April 2007

Published by
Centre for Education and Communication
173-A, Khirki Village, Malviya Nagar, New Delhi – 110017
Ph: +91 11 2954 1858/ 1841/ 3084/ 2473
Fax: +91 11 2954 5442/ 2464
Email: cec@cec-india.org; Web: www.cec-india.org

CONTENTS

1. Introduction

Over the past two decades, there has been rapid expansion of the small sector in the tea industry in India. Small tea growers' (STG) gardens exist in as many as 15 states. These states can be grouped as traditional and non-traditional. The traditional states are Assam, West Bengal, Tripura and Himachal Pradesh in North India, and Tamil Nadu, Kerala and Karnataka in South India. The non-traditional states are Uttaranchal, Bihar, Sikkim, Arunachal Pradesh, Manipur, Meghalaya, Mizoram and Nagaland. Except Assam, almost all the northeastern states and the state of Uttaranchal are at experimental stage, and they are the new entrants in tea cultivation.

The price of green leaf was at an all-time high in the year 1998-99, and thereafter, it started declining. This has pushed the STGs into distress. It is understood that small tea growers and their workers are at the receiving end in the supply chain of the tea industry. They have little voice or bargaining strength for their produce (green leaf), with bought-leaf factories (BLF) exercising monopoly over them. This, in turn, influences the condition of workers engaged in such farms.

Rationale of the Study

The research aims to study the cost of cultivation of tea green leaf, pricing of green leaf, market conditions (i.e., marketing channels of green leaf), relationship of STGs and BLFs, policy measures by Tea Board of India (such as price-sharing formula, or PSF) and their effective implementation, and alternative model of price determination of green leaf in order to improve the bargaining power of STGs. It focuses on aspects such as farm management, scientific agricultural practices and remunerative return, which will ultimately enhance the viability of the STGs in the long run.

2. Objectives of the Study

- Factors affecting cost of green-leaf production
- Existing study done on cost of production by various organisations with field validation and regional variation dynamics
- Suggestions to reduce cost of green-leaf production
- Fixing of green-leaf price and its regional dynamics
- Price determination and the relationship between STGs, BLFs and leaf agents
- Relationship of green-leaf price with auction price and regional dynamics
- Introduction of price-sharing formula and its effective implementation

3. Database and Methodology

The research fieldwork was carried out in Assam, West Bengal, Tamil Nadu and Kerala. Sources of information collected are as follows:

- Tea Board of India at Kolkata, Siliguri, Guwahati, Jorhat, Coonoor, Kottayam and Kochi
- UPASI, Coonoor

- Krishi Vigyan Kendra, Coonoor
- INDCO, Coonoor
- Tocklai Research Institute, Jorhat
- Department of Tea Husbandry and Technology, Assam Agriculture University, Jorhat
- Department of Tea Management, North Bengal University, Darjeeling

Data and information were also collected from non-governmental sources across all the states. These are as follows:

- Wayanad Agro-Movement Tea Company Limited, Mananthyvady
- Wayanad Tea Producers' Marketing and Processing Co-operative Society, Sultan Bathery
- All Assam Small Tea Growers' Association, Assam
- United Forum of Small Tea Growers' Associations, North Bengal
- STG societies in different states

In addition, an open-ended schedule was used to verify the existing field realities related to cost of production of green leaf (per-kg assessment), pricing of green leaf, role of leaf agents, and impact of price-sharing formula.

Methodology

The present study is based on fieldwork carried out over three months (August, September and October) in 2006 in the states of Assam, West Bengal, Tamil Nadu and Kerala. Interviews, individual discussions as well as focus-group discussions of various groups and individuals related to small tea growers were conducted. The STGs in villages covered under the study are: in Tamil Nadu, Addavali and Jacknarai villages in Kotagiri block, Kookal and Ajjur villages in Ooty block, and Ambalamol village in Gudalur block; in Kerala, Thavinjal, Valad and Peria villages in Mananthyvady block, and Chulliyode village in Sultan Bathery block; in Assam, Lahoal village in Dibrugarh district, Ketetong village (Singhpho Tribal village) in Tinsukia district, and Moranhat village in Sibsagar district; and in West Bengal, Jahuri-Talma in Jalpaiguri district and Srikrishnapur and Ramganj in Uttar Dinajpur. The concerned officials were also consulted on relevant issues. Unpublished reports, documents and leaflets prepared by different organisations concerned with STGs have been collected as well.

Study Locations

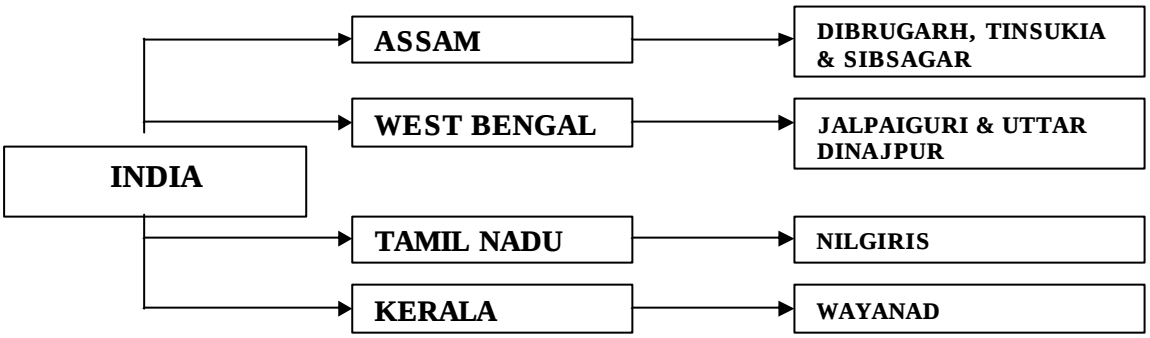
The STGs are scattered over 15 states in India, with the four major concentration areas being Assam, West Bengal, Tamil Nadu and Kerala. Approximately 90 per cent STGs are found in these four states. The crisis in the tea industry has badly hit these regions. The STGs are unorganised and have limited market access for their produce. Moreover, the situation of STGs in India is unlike that in Sri Lanka and Kenya, where they are protected through nodal agencies like Tea Small Holdings Development Authority (TSHDA) and Kenya Tea Development Agency Limited (KTDA), respectively.

In the four Indian states mentioned, the project area is confined to the dominant small-scale tea-growing districts, as shown in Table 1 and Figure 1:

TABLE 1: SPATIAL ASPECTS OF THE PRESENT STUDY

State	District
Assam	Dibrugarh, Tinsukia, Sibsagar
West Bengal	Jalpaiguri, Uttar Dinajpur
Tamil Nadu	Nilgiris
Kerala	Wayanad

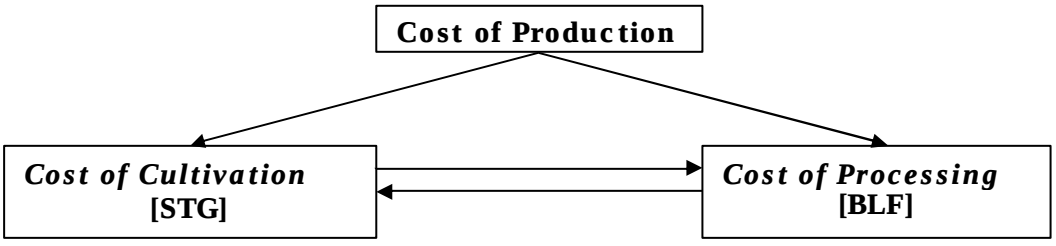
FIGURE 1: A MODEL SHOWING THE SPATIAL ASPECTS OF THE PRESENT STUDY



4. Concept of Cost of Production

Tea production involves cost at two stages: one is at the growers' level and may be termed as cost of cultivation; and the other is at the factory level and known as cost of processing. These two stages together are included in 'cost of production' of made tea. (Figure 2) In the small-scale tea sector, STGs are involved in cultivation and production of green leaf and thereby related to cost of cultivation, and on the other hand, BLFs are engaged in processing of made tea from green leaf and related to cost of processing.

FIGURE 2: CONCEPTUAL MODEL FOR COST OF PRODUCTION IN STG SECTOR



It is observed that cost of production in tea industry varies from one region to another, and also from one country to another. Among tea of different origin, Indian tea involves very high cost of production. The cost of production for one kilogram of tea in North India is US$1.62, and in

South India it is US$1.48. In Kenya, it is US$1.16/kg for the estate sector and US$1.10/kg for the smallholder sector; and in Sri Lanka it is US$1.23/kg. The selling cost of tea is comparatively higher in Kenya and Sri Lanka, and currently fetches a maximum price of US$1.90/kg. Price of Indian tea remains at about US$1.32/kg.

TABLE 2: COST OF MADE-TEA PRODUCTION IN DIFFERENT COUNTRIES

[2001]

Country	Cost of production (US$/kg)	Average price (US$/kg)
India	1.62	1.30
Sri Lanka	1.23	1.61
Bangladesh	0.98	1.05
Vietnam	0.96	N.A.
Indonesia	0.58	0.97
Kenya	1.16	1.53
Malawi	0.84	0.87

Source: 115th AGM Report, Assam Branch Indian Tea Association, p. 25

There are three kinds of costs involved in tea production – namely, cultivation costs, manufacturing or processing costs, and social costs. Social costs are limited to estate gardens or large plantations that provide education, healthcare, food, sanitation, and recreational facilities for the workers. Similarly, manufacturing or processing costs are related to the large gardens only, and this involves the production of made tea. STGs do not own factories for processing green leaf; therefore, processing cost is not relevant to them. Here, cost of production mainly refers to the cultivation cost.

Taking the cultivation costs alone into consideration, we can see that tea cultivation is one of the most labour-intensive agricultural activities, and among the operations involved in tea production, plucking is one of the most labour-intensive. Nearly 70 per cent of the labour in production is involved in the plucking operation, and approximately 40 per cent of the cost of production of tea goes into payment for the labour involved in plucking. Thus, cost-cutting measures in this part of the operation would significantly reduce the cost of production. Mechanisation is one of the effective alternatives that can reduce costs, but in countries like India, a large number of people are employed in tea plantations and the view is that such an alternative will pose a major threat to their livelihood.

Labour efficiency and productivity is a real issue affecting cost of production, which makes it essential to know the factors influencing the efficiency of the labour force. The various factors influencing labour efficiency are yield of crop, plant density, age of the plant, plant variety, climatic conditions and topography. The efficiency also varies according to the physique and psychology of the workers. Wages and incentives given to the workers also influence efficiency. Interestingly, there are visible seasonal differences in plucking efficiency – to illustrate, in India during the peak season, plucking efficiency of a worker is high, but goes down during the lean season due to low production.

5. Cost of Green Leaf Production

The operational cost in STG gardens varies from one region to another and from one grower to another. Local climate, soil characteristics, management of the garden, efficiency of the grower, etc., are factors that play a major role in production, which finally adds to the cost of cultivation. The Institute of Cost and Works Accountants of India, New Delhi, has done studies in major small tea-growing states in India including Assam, West Bengal, Bihar, Tripura and Himachal Pradesh in North India, and Tamil Nadu and Kerala in South India.

The present study is the first study based on all-India data on STGs. Although the study has gaps, it is still a first step in measuring the efficiency of the STG sector. The study shows that the per-acre productivity is highest in Assam, with 5,023 kilograms, followed by Bihar and West Bengal with 4,750 kilograms and 4,651 kilograms, respectively. (Table 3) The lowest productivity is found to be in Himachal Pradesh, with 2,376 kilograms. The per-kilogram green-leaf production cost is highest in Himachal Pradesh, followed by Kerala (Rs 7.62 and Rs 6.31, respectively).

TABLE 3: COST OF GREEN LEAF PRODUCTION IN INDIA

(As per Institute of Cost and Works Accountants of India, New Delhi)

State	Yield/acre (in kg)	Cost of production (per-kg leaf in Rs)
Assam	5,023	6.29
West Bengal	4,651	6.27
Bihar	4,750	5.80
Tripura	3,484	5.07
Tamil Nadu	3,917	5.33
Kerala	4,392	6.31
Himachal Pradesh	2,376	7.62

Source: Unpublished data collected from United Forum of Small Tea Growers' Associations, North Bengal

The cost of cultivation has also been calculated by Krishi Vigyan Kendra in Nilgiris, and forwarded to the INDCO head office at Coonoor. Based on the recommended agricultural practices and parameters of improved productivity, the study shows that in seedling STG gardens the per-kilogram green-leaf production cost is Rs 6.00, and in clonal gardens it is Rs 5.75. (Tables 4 and 5) However, the assumptions here belong to an ideal situation, while in reality, the practices vary from one garden to another and deviate from the Krishi Vigyan Kendra guidelines.

TABLE 4: COST OF CULTIVATION IN SEEDLING TEA IN NIGIRIS

(Yield 3,200 kg/acre/year)

Sl no.	Nature of work	Cost of cultivation / hectare (in Rs)	Cost of cultivation/kg (in Rs)
1	Manuring	3,748.38	1.17
2	Pest control	2,026.00	0.63
3	Weed control	1,125.40	0.36
4	Shade regulation	375.00	0.12

5	Growth promoter and nutrients	1,065.30	0.33
6	Plucking	9,600.00	3.00
7	Plucking incentives	160.00	0.05
8	Leaf transport, bags, etc.	1,100.00	0.34
Total		**19,200.08**	**6.00**

Source: Unpublished data collected from INDCO head office, Coonoor

It is noticed that seedling tea plants are more resistant to pest attack as compared to clonal tea plants, and the quality of green leaf is also better in seedlings. However, plucking cycles are longer in case of seedling plants, and the productivity is low at 3,200 kilograms/acre, as against 5,000 kilograms/acre in clonal plants. In Nilgiris, STG gardens are composed of both clonal and seedling plants.

TABLE 5: COST OF CULTIVATION IN CLONAL TEA IN NILGIRIS

(Yield 5,000 kg/acre)

Sl no.	Nature of work	Cost of cultivation / hectare (in Rs)	Cost of cultivation/kg (in Rs)
1	Manuring	4,441.17	0.89
2	Pest control	6,260.00	1.25
3	Weed control	1,350.40	0.28
4	Shade regulation	375.00	0.08
5	Growth promoter and nutrients	1,737.45	0.34
6	Plucking	12,480.00	2.50
7	Plucking Incentives	520.00	0.10
8	Leaf transport, Bags etc.	1,600.00	0.32
Total		**28,764.02**	**5.75**

Source: Unpublished data collected from INDCO head office, Coonoor

Assam Agricultural University has made a calculation on the basis of their field exposure and experience through their pilot tea plantation in the university campus. The average cost of green-leaf production in Assam is Rs 8.24/kilogram, and the details of the operational heads are given below in Table 6. Here, it is found that pruning (light skiffing) is a regular annual activity in all the small tea gardens in Assam and West Bengal, and it coincides with a dormant production period extending from January to March.

TABLE 6: AVERAGE COST OF GREEN LEAF PRODUCTION IN ASSAM

Sl no.	Cost of production/hectare	
A	**Operation**	**Expenditure (in Rs)**
1	Pruning	2,800.00
2	Tipping	1,600.00
3	Plucking	26,120.00
4	Manuring	1,200.00
5	Mechanical weeding	1,800.00
6	Chemical weeding including materials	2,500.00
7	Spraying of pesticides/fungicides/nutrients and	2,600.00

	growth regulators	
8	Maintenance of drains	800.00
9	Maintenance of green-leaf sheds, offices, fencing	3,000.00
10	Maintenance of implements and sprayers	500.00
11	Preparation and distribution of tea to workers during working days	3,000.00
12	Leaf handling, weighing and loading	3,840.00
13	Supervision	12,000.00
14	Transportation and commission of agent	7,500.00
15	Payment of bonus for five workers @ 10 %	6,240.00
16	Injury and incidental facilities to workers	1,000.00
	Total	**76,500.00**
B	**Material**	
17	Manures and fertilisers	8,850.00
18	Pesticides	6,000.00
19	Fungicides	1,500.00
20	Growth regulators	3,000.00
21	Plucking materials and protective clothing	6,250.00
	Total	**25,600.00**
C	**Non-recurring farm implements:** Sprayer, drum, bucket, tarpaulin, handcart, weighing equipment, cultivation implements, tubewell and pipes	**20,500.00**
22	Depreciation on non-recurring @ 15 %	3,075.00
	Total 1 to 22 (A+B+C)	**105,175.00**
	Interest @ 17.5 %	**18,405.00**
	Total expenditure	**123,580.00**
	Total crop/hectare	**15,000.00**
	Cost of production/kg of green leaf	**8.24**

Source: Assam Agricultural University, Jorhat

6. Cost of Green Leaf Production – Experience of STGs

As mentioned earlier (Tables 4 and 5), the cost of green-leaf production is Rs 6.00 and Rs 5.75 in Nilgiris, and Rs. 8.24 in Assam. It is important to note that both sets of institutional data on the cost of green-leaf production are based on the ideal situation, wherein localised intervening factors are not considered or deficiency of credit, money, or initial capital is not taken into account. It is also noticed that the lack of institutional credit pushes STGs into debt trap, which indirectly results in non-timely application of inputs, in turn reducing production and simultaneously increasing cost of production. The plucking cost in Kerala is relatively more as compared to Assam, West Bengal and Tamil Nadu.

Case Study I: Small Tea Grower

This study is based on responses given by Shiv Kumar from Kookal village in the Ooty block of Nilgiris. He has six acres of tea garden, but it is not registered with Tea Board of India. The tea

bushes are about 25 years old, and he has only clonal plants. The total annual production is 12,000 kilograms of green leaf, i.e., 2,000 kilograms/acre, and the cost of green-leaf production per kilogram is Rs 8.50.

TABLE 7: COST OF CULTIVATION (PER KILOGRAM OF GREEN LEAF)

Item	Amount (in Rs)	Remarks
Plucking	3.00	The price breakup is related to the respondent's own garden, and expenses vary from one garden to another.
Carrying green leaf	1.00	
Cleaning	1.00	
Pesticide	2.00	
Fertiliser	1.50	
Total	**8.50**	

Source: Shiv kumar (STG), Kookal village, Ooty block , Tamil Nadu

Case Study II: Small Tea Grower

This study is based on interaction with M.C. David, resident of Thavinjal village of Mananthyvady block in Wayanad. He has 2.5 acres under tea cultivation and another 2.5 acres allocated to coffee, pepper and coconut. The production is 6000 kilograms of green leaf per acre. The cost per kilogram of green-leaf production is very high in his garden, at Rs 9.00.

TABLE 8: COST OF CULTIVATION (PER KILOGRAM OF GREEN LEAF)

Item	Amount (in Rs)	Remarks
Plucking	4.00	The plucking cost is relatively high in Kerala as compared to Tamil Nadu, though topographic influences are same in both the states.
Carrying green leaf	1.00	
Cleaning	1.00	
Pesticide and manuring	1.50	
Weed control and cleaning	1.50	
Total	**9.00**	

Source: M.C. David (STG), Thavinjal village, Mananthyvady block , Kerala

Case Study III: Advisory Officer, UPASI Regional Office, Gudalur

It is brought to notice by the advisory officer that most of the STGs do not maintain regular expenditure records, due to which it is difficult to arrive at a clear conclusion regarding cost of green-leaf production. According to him, in general, the cost of cultivation in small grower gardens is seven to eight rupees per kilogram. He also informed that the processing cost in the BLFs is Rs 12-14 per kilogram. The outturn percentage is 25 per cent and four kilograms of green leaf is required to make a kilogram of made tea.

Case Study IV: Small Tea Grower, Assam

This cost-benefit analysis is based on the responses of an STG from Moranhat village in Sibsagar district of Assam. He has 1.13 acres under tea cultivation, and is solely dependent on the same. Table 9 shows his profit margin from 2003 to 2005, excluding his own labour.

TABLE 9: COST-BENEFIT ANALYSIS OF AN STG IN ASSAM

Year	Return (in Rs)			Operational expense (in Rs)		Net profit (in Rs)
	Green leaf	Average price	Total	Plucking cost	Garden maintenance	
2003	6,142	6.73	41,340	8,704	10,723	21,913
2004	6,303	8.56	54,006	9,819	12,295	31,892
2005	5,870	6.44	37,820	9,570	13,660	14,540
2006	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

Source: Sanjib Saikia, Sibsagar, Assam

The impact of topography on cost of green-leaf production is clearly seen if one analyses the responses of STGs from the field. The average plucking productivity in Tamil Nadu and Kerala ranges from 15 kilograms to 20 kilograms per worker. On the other hand, the average plucking productivity in Assam and West Bengal is 30 kilograms per worker. This happens due to the locational aspects of hilly and undulating areas in Tamil Nadu and Kerala, implying that in addition to the plucking activity itself, workers also require extra energy for climbing the slopes and carrying leaf bags behind them. This ultimately reduces plucking productivity, causing high plucking cost in STG gardens.

7. Cost of Processing of Made Tea

It is difficult to collect any information on the cost of processing of made tea in BLFs, since most BLFs are reluctant to share information on the subject. With continuous effort and persuasion, some benchmark information has been achieved for the present study.

Case Study I: The Salisbury Industrial Co-operative Tea Factory Limited, Gudalur, Nilgiris

The Salisbury Industrial Co-operative Tea Factory is the most successful unit under the INDCO tea factories. Presently, it has 1,600 STG members. Based on the interaction with the Industrial Co-operative Officer Mr Kupparajan, it can be stated that the success of the Salisbury CPFs has been shaped by certain factors as mentioned below:

- Collection of quality green leaf from member STGs
- Optimum utilisation of capacity
- Cancellation of membership of disloyal STGs and introduction of loyalty-scaling technique by the management
- Full-hearted support of employees and better coordination among factory staff, STGs, management and workers

The monitoring of loyalty of STGs has assured the fulfilment of threshold requirement of green leaf/day. Therefore, the factory never faces any kind of leaf shortage during any of the months in a year. The optimum threshing capacity is utilised by the management, which ultimately reduces per-kilogram green-leaf production. The loyalty status of an individual STG is assessed as follows:

TABLE 10: LOYALTY STATUS OF STGs IN SALISBURY INDCO TEA FACTORY

(July 2006)

Sl no.	Parameter of loyalty assessment	No. of STGs
1	Number of members under 100 % loyalty (i.e., supply more than 200 kg green leaf/acre)	678
2	Number of members under 50 % loyalty (i.e., supply more than 100 kg green leaf/acre)	537
3	Number of members under 25 % loyalty (i.e., supply more than kg green leaf/acre)	303
4	Number of members who have not supplied green leaf during the month, termed as disloyal members	88
	94.52 % of loyal STGs	1,606

Source: Short notes on the working of Salisbury INDCO Tea Factory, Gudalur

The cost of green-leaf processing at the Salisbury INDCO Tea Factory was Rs 14.58 in the month of July 2006, and the average cost of processing in the first financial quarter, i.e., April to June 2006, was Rs 13.10. The most important point to notice here is that the leaf collection expenses (from garden to factory) is borne by the factory, and included in the cost of processing.

TABLE 11: COST OF PRODUCTION (PER KILOGRAM OF MADE TEA)

Item	Period	
	July 2006	***April to June 2006***
	Amount (in Rs)	**Amount (in Rs)**
Green leaf	44.85	38.42
Leaf collection expense	1.51	1.28
Fuel (firewood)	2.64	2.83
Power (electricity)	3.15	2.95
Wages	1.99	1.41
Factory overheads	2.53	2.16
General overheads	1.09	1.04
Packing	0.78	0.78
Tax	0.30	0.30
Transport of made tea	0.59	0.35
Total	**59.43**	**51.52**
Cost of processing	**14.58**	**13.10**

Source: Unpublished data collected from G. Kupparajan, Industrial Co-operative Officer, Salisbury INDCO Tea Factory

Case Study I1: INDCOSERVE – The Tamil Nadu Small Tea Growers' Industrial Co-operative Factories' Federation Limited

The cost of green-leaf processing at the INDCO tea factories together is a little higher; it was Rs 17.32 for the month of July 2006 and Rs 18.64 for the first financial quarter from April to June 2006. The difference between Salisbury Tea Factory and INDCO tea factories together in the month of July 2006 was Rs 2.75 for made tea/kilogram, and in the first financial quarter from April

to June 2006, it was Rs 5.54 for made tea/kilogram. It is evident that efficient management and optimal use of resources have immense impact on cost of processing. Moreover, the general overheads cost also increases when all the INDCO tea factories are taken together.

TABLE 12: COST OF PRODUCTION (PER KILOGRAM OF MADE TEA)

Item	Period	
	July 2006	***April to June 2006***
	Amount (in Rs)	**Amount (in Rs)**
Green leaf	29.63	27.57
Leaf collection expense	0.93	0.53
Fuel (firewood)	3.40	4.34
Diesel	0.08	0.44
Power (electricity)	3.51	3.29
Wages	1.73	2.55
Factory overheads	3.79	1.66
General overheads	2.02	4.13
Packing material	0.80	0.77
Tax (excise duty)	0.30	0.30
Transport of made tea	0.16	0.63
Total	**46.95**	**46.21**
Cost of processing	**17.32**	**18.64**

Source: Unpublished data collected from managing director, INDCOSERVE, Coonoor

Factors Affecting Cost of Production

- **Input costs** (including those of fertilisers and manures, chemicals and pesticides, weedicides, fuel and transportation): Across all states, STGs buy these inputs from the local markets, where the cost is always higher than the government-prescribed rate. Application of manure and fertilisers is based on the guidelines of the local fertiliser and agro-medicine shops, which have vested interests in marketing of some specified company products. In this way, some unwanted applications increase the cost of cultivation on one hand, and the chemical residues in made tea on the other.
- **Unscientific cultivation practices** lead to lower yield and poor-quality leaf, which ultimately is related to the returns for STGs. Absence of proper and timely pruning hinders the bush formation of the plants and minimises the spread of plucking table. The huge number of vacancies in the small tea gardens also indicates the ill-management of the tea fields. Absence of pilot and demonstration nurseries in all the small tea-growing areas of the four states restricted knowledge dissemination among STGs.
- **Labour costs** are increasing, but the price of green leaf has been stagnant over the years or has reduced below the subsistence level. Plucking of green leaf is a major activity performed throughout the year in small tea-growing gardens. In Tamil Nadu and Kerala, this regular work is performed by female workers to minimise the cost of plucking, while male workers are engaged in cleaning, draining, pruning, carrying, spraying and manuring.

On the other hand, in Assam and Kerala, both male and female workers are engaged in plucking as well as other regular work in the gardens.

- **Technical know-how** of STGs is very limited. Training and agro-extension services to the growers are inadequate. In Tamil Nadu, under the Tea Board's quality upgradation programme, Krishi Vigyan Kendra of Coonoor developed field training in different localities in Nilgiris. However, the visibility of such programmes is negligible. In Kerala, any such initiative is absent. In Assam and West Bengal, Tea Research Association (TRA) generally organises one-day workshops and training for STGs at different localities. This activity is in limited number, and the impact is meagre. Thus, a large number of STGs remain untouched by these programmes.
- Lack of **mechanised harvest of green leaf**: In Kerala and Tamil Nadu, some local-made scissors are available for plucking. This increases plucking productivity of a worker and ultimately reduces the cost of cultivation in the STG sector. UPASI has approved such plucking tools and it is widely used. In Assam and West Bengal, such tools do not exist.
- **Remunerative return** from the tea gardens is a deciding factor for better management and skill development, procuring market information, and entrepreneurship development. If green leaf prices are stable in a year, STGs also take initiatives for manuring and other operational aspects in tea fields. This, in turn, enhances productivity as well as good bush health, and thereby reduces cost of cultivation.

8. Pricing of Green Leaf

Pricing of green leaf is totally unsystematic in all the four states; it is arbitrary, in fact. It varies from one locality to another, and even in the same locality, green leaf price varies across BLFs. There is an absence of regulatory measures of green leaf marketing and lack of transparency in transactions and payment made to STGs. BLFs hardly share any information with the researchers. There is no participation of STGs in fixation of green leaf price. The BLFs are in a better position to dictate the leaf market, and the existence of leaf agents plays a vital role in aggravating the situation.

There are certain reasons to supply green leaf to agents. They provide vehicle for carrying green leaf, facilitate advance money and instant cash payment, and show no qualm in compromising on quality and acceptance of coarse leaf. If the market is to be linked directly to STGs, some of these roles have to be performed by local village-level institutions like primary producer societies (STG societies).

TABLE 13: TREND OF GREEN LEAF PRICE IN ASSAM AND WEST BENGAL

Year	Assam (Green leaf price/kg, in Rs)	West Bengal (Green leaf price/kg, in Rs)
2000	7.63	6.02
2001	6.75	7.11
2002	7.07	5.89
2003	6.91	5.30
2004	8.32	7.71

2005	6.56	5.48
2006	7.99	N.A.

Source: Data compiled from field verification and short notes of United Forum of Small Tea Growers' Association, North Bengal

Factors Affecting Pricing of Green Leaf

- **Lack of systematic organisation** leads to poor bargaining strength of STGs in the tea industry. As of now, there are STG associations at the block/district level which address macro issues like subsidies of the Tea Board, pruning scheme, and land issues. At village level, though, STGs are not organised to improve their position. Most of the times, STGs are not aware of functions and activities of the association at the grassroots level. There is a wide gap between STGs at the village level and executive members of the associations. It is also observed that at the grassroots level, the awareness level among STGs is very low across all the states in India. Bargaining strength of STGs is just non-existent at the village level. Therefore, formation of STG societies in villages and linking these to associations at the higher level can be fruitful for the overall development of STGs in all the states.
- STGs are compelled to sell their produce (green leaf) after plucking, as it is **perishable in nature** and cannot be stored; as such, BLFs have a monopoly over the situation. This has minimized the bargaining strength of the STGs. STGs are at the receiving end in the market, and they have no voice in determining the green leaf price.
- Mushrooming of the **growth of leaf agents** and the consequent higher degree of dependence on leaf agents has not only reduced the return of STGs, but also impacted the quality of leaf through malpractices and adulteration by the agents.
- Tea Board of India has evolved the **price-sharing formula**, but it is at an infancy stage of implementation. Moreover, lack of transparency and absence of strict regulatory measure by the board has hindered the realisation of the formula.
- **Absence of a proper authority or platform** to monitor the market situation of the STGs and address the problems faced by them has been another major hindrance.
- **Assessing the quality of green leaf** is manual and arbitrary; there is lack of mechanised measuring of the quality of green leaf. In Idukki, it has been found that from 100 grams of green leaf, samples are picked up randomly and coarse leaves – i.e., more than three leaves and a bud – are separated and taken to the weighing machine. On the basis of this, the percentage of coarse leaf is calculated; for instance, 10 grams of coarse leaf means 10 per cent of coarse leaf is assessed and 90 per cent is of good-quality leaf. Accordingly, the price of green leaf is fixed. In Assam and West Bengal, green-leaf quality assessment is opposite to the method in South India. There, fine leaf percentage is measured on the basis of two leaves and a bud. (Samples of 100 grams are picked up randomly and then fine leaves – i.e., two leaves and a bud – are separated and measured in the weighing machine, and a target of 30 per cent means 30 grams fine leaf is an acceptable limit in Assam and West Bengal.)

9. Business linkage status between STGs and BLFs

Very few STGs are directly related to BLFs – that is, very few of them directly sell their green leaves to the factories. Generally, growers are dependent on agents for selling. Although agents deduct their commission from the green leaf price for linking to the BLFs, growers found them to arrange a more convincing deal. The reason could be that agents allow them to supply coarse leaf, and by doing so, they try to minimise the plucking cost of green leaf. Overall, it appears ambiguous and somewhat complicated to identify the BLFs' 'green leaf hinterland' as STGs are not directly related to them in terms of business. It is also noticed that at times growers supply good-quality leaf, though without getting a fair deal. Also, BLFs also favour agents because it allows them to easily suppress the price of green leaf by centralising the power and business dealing at one location, or better still, at the hands of a few individuals.

In Tamil Nadu, STGs are well-knitted and linked with the INDCO factories. Fifteen INDCO factories are functional at present, with membership of 20,049 STGs and area under tea at 31,848 acres. INDCO factories also provide credit facilities, technical advice for agricultural practices, subsidised fertilisers and medicines, etc., to their member growers, who are distributed across Nilgiris. Presently, there is a ban on the inclusion of new members to the INDCO factories, and interested STGs can only be 'associate members'[1]. It may also be noted that most STGs in Nilgiris are provisionally registered with Tea Board of India under the Price Subsidy Scheme, and the absence of valid land documents with proper survey records is the root cause of such provisional registration.

TABLE 14: INDCO TEA FACTORIES IN TAMIL NADU

Sl no.	Name of INDCO tea factory	Number of STGs	Area covered (in acres)
1	Kundah	1,466	2,294
2	Karumbalam	732	1,441
3	Mercunad	1,481	2,268
4	Mahalinga	1,800	2,641
5	Manjoor	1,435	2,124
6	Ithalar	2,016	2,362
7	Pandalur	1,481	2,934
8	Kaikatty	1,379	2,343
9	Kattabettu	879	1,705
10	Salisbury	1,600	2,931
11	Frontier	2,108	2,873
12	Kinnakorai	820	1,303
13	Bikkatty	947	1,151
14	Ebbanad	790	1,685
15	Bitherkad	1,115	1,794
Total		**20,049**	**31,848**

[1]An 'associate member' can supply green leaf to the INDCO factories, but cannot avail any kind of technical guidance, subsidised fertiliser and medicines, or credit facilities.

Case Study: The Salisbury INDCO Tea Factory

The Salisbury Industrial Co-operative Tea Factory Ltd was initially started with 55 members. Presently, it has 1,600 member STGs, with a total tea area of 2,931 acres. The factory commenced its production from September 16, 1983. The factory is equipped with machineries for dual production of both CTC and orthodox types of teas. The factory continuously stands first in the manufacturing of high-quality tea as well as in fetching of better sale average among other INDCO tea factories in Nilgiris. The factory has continuously registered profits since 1987-88. The major portion of profits at the end of every year is distributed to the members as 'additional leaf cost', while the factory retains the profit to a minimum reasonable level to sustain viability. The Tea Board of India, Kolkata, have awarded the factory with a seal and a certificate for its productivity and quality of tea. The services rendered by the factory are as follows:

- The factory purchases green tea leaves directly from the fields of member STGs by providing transport facilities at the expense of the factory and paying reasonable rate for the leaves. The made tea manufactured out of green leaf are sold in the auction centre Teaserve at Coonoor.
- According to the seasonal needs, the factory disburses agricultural inputs like fertilisers, plant protection chemicals and other equipments to member STGs, along with latest technical guidance for proper usage. The value of the inputs are recovered on instalment basis to ease the burden on members.
- Training programmes exclusively for member STGs on the improved methods of tea cultivation are conducted with the help of experts from UPASI, KVK, Tea Board, and staffs from Hill Area Development Programme.

TABLE 15: SALISBURY INDCO TEA FACTORY

Year	Growth of membership	Green leaf purchased (in lakh kg)	Average green leaf price paid to STGs per kg
2001-02	1,953	56.83	6.25
2002-03	1,968	71.27	6.40
2003-04	1,645	81.44	5.63
2004-05	1,663	114.37	8.00
2005-06	1,653	107.12	6.69
2006-07*	1,606	35.90	9.45

* Up to July 31, 2006

Source: Short notes on the working of Salisbury INDCO Tea Factory

Case Study – Marketing Model: Wayanad Tea Producers' and Processing Co-operative Society Limited

In Wayanad district of Kerala, STGs are directly linked with Wayanad Tea Producers' and Processing Co-operative Society Limited, situated at Chulliyode, Sultan Bathery. This society has 2,326 STGs as members, with a tea cultivated area of 3,960 acres. (Table 16) This society imparts training to the growers for quality plucking and scientific management of gardens, and also

provides credit facilities to members. This is unlike other existing societies in India, and they have also developed a brand called TEACOPS[2].

The society was formed with a view to addressing the marketing problem faced by the STGs and the non-existence of BLFs in the Sultan Bathery block. The main objective is to facilitate the STGs in processing the green leaf. Presently, this society is associated with three factories –A.V. Thomas and Company, Harrison Malayan Limited, and Salisbury INDCO Tea Factory. Farmers are given the green leaf price at par with INDCO Tea Factory prices. The society buys made tea from the BLFs and co-operative factories, where they supply green leaf, and sells packed tea to its members as well as nearby localities within their area of operation.

TABLE 16: DISTRIBUTION OF MEMBER STGs OF WAYANAD SMALL TEA GROWERS' CO-OPERATIVE SOCIETY

Panchayat	Number of STGs	Area cultivated (in acres)
Nenmeni	1,063	1,571
Ambalavayal	554	762
Noolpuzha	89	179
Sultan Bathery	78	177
Muppainad	392	793
Meppadi	150	478
Total	**2,326**	**3,960**

Source: Short notes on Wayanad Small Tea Growers' Co-operative Society

The Wayanad Agro-Movement Tea Company has established a tea processing factory in Thavinjal village, Mananthyvady, and initiated tea production as well. Its horizontal coverage is 2,800 acres of tea land with 956 STGs. The church society provided building and land; and machineries have been purchased with loan amount of Rs 68 lakhs. There are five CTC machines installed with a threshing capacity of 24,000 kilograms/day. There is ample scope to strengthen green leaf price. The monopoly of BLFs in Wayanad district and the growth of leaf agents can be reduced with the development of such societies. Presently, the price of green leaf is little better in comparison to previous years.

There is an absence of co-op factories in the states of Assam and West Bengal. In these two states, there is an urgent need for the formation of such societies. As of now, STGs are not involved in final production of tea, so the cost of factory production shown by BLFs is somewhat exaggerated and is ultimately imposed on STGs. There is scope of improvement in green leaf price if STGs are involved in final production of tea by forming STG societies in the small tea-growing areas in these states.

The formation of STG societies is comparatively older in Assam than in West Bengal. In both the states, over the years, the formation of STG societies has improved the business relations between BLFs and STGs. Now, a few BLFs are linked with STGs in formal agreements for purchasing green leaf for a year, and similarly, in the successive year they can arrive at another agreement for

[2]TEACOPS has three packet sizes of CTC teas, and these are 250 gms, 500 gms, and 1,000 gms.

supplying leaf to a particular factory. In this way, they can also assess the business deal with a particular factory on yearly basis.

In Assam, a new idea has been popularised by BLFs to discourage the formation of STG societies. BLFs have fixed incentive targets for the quantity of green leaf/day supplied by leaf agents. These are as follows:

Suppose,

Less than 5,000 kg/day = Rs 6.00/kg

5,000-10,000 kg/day = Rs 6.50/kg

More than 10,000 kg/day = Rs 7.00/kg

In such cases, leaf agents always take undue advantage by supplying more amount of leaf. On the other hand, STG societies with their limited memberships have fixed amount of green leaf collection in a day. So, they cannot receive the incentive price.

10. Role of Auction Price, Price-sharing Formula and Green Leaf Price

It is generally expressed that the price of green leaf paid to the STGs depends on made-tea price in the market. Tea Board of India publishes the made-tea price of CTC tea in the respective state on monthly basis, under the guidelines of price-sharing formula. This made-tea price of CTC tea is calculated at Tea Board of India, Kochi, for South India, and Tea Board of India, Kolkata, for North India. Officially, it has to be circulated to all Tea Board offices, associations, STG societies and co-operatives for sharing the market information with all stakeholders. However, t was noticed during the field survey that all Tea Board offices, associations, STG societies and co-operatives, and other stakeholders in all the four states were not informed on monthly basis regarding the CTC tea as well as green leaf price paid to the STGs. The guidelines of the price-sharing formula are not properly implemented, and fair price for green leaf is less distributive to the STGs.

TABLE 17: AVERAGE PRICE OF CTC TEAS IN NORTH INDIA

Month	Assam	West Bengal	Tripura	Arunachal Pradesh	North India
April	76.30	74.68	50.77	73.26	N.A.
May	76.01	75.84	61.35	69.66	N.A.
June	82.99	74.25	65.32	76.80	N.A.
July	75.20	67.97	57.77	68.20	N.A.

Source: Data collected during field survey from Tea Board of India, Jorhat

It is established that the average price of CTC teas is relatively higher in North India as compared to South India. It is clearly visible from Table 17 and Table 18. Most of the months, the price of CTC teas is almost Rs 20 higher in North Indian states than in the South Indian states. However, the green leaf price is depressing in Assam and West Bengal. While the average green leaf price during the months of August-September 2006 was Rs 6.50 to Rs 7.50/kilogram in Assam and West Bengal, it was Rs 7.75 to Rs 8.50/kilogram in Tamil Nadu and Kerala during the corresponding

period. The situation evidently requires some more investigation related to pricing of made tea and green leaf.

TABLE 18: AVERAGE PRICE OF CTC TEAS IN SOUTH INDIA

Month	Kerala	Tamil Nadu	Karnataka	South India
April	51.27	47.54	51.41	48.42
May	50.44	47.60	50.49	48.40
June	51.53	48.20	49.90	48.98
July	51.12	48.73	53.38	49.30

Source: Data collected during field survey from Tea Board of India, Kochi

Tea Board of India has introduced price-sharing formula (PSF) since April 2004, and as a result, data and information have been collected related to business linkage between BLFs and STGs. It is really premature to come to conclusion on all aspects of PSF until information is collected over a period of time (from April 2004 till date) through 'E' returns of BLFs from the three respective offices (TBI, Kochi, for South India and TBI, Siliguri, and TBI, Guwahati, for Assam and West Bengal, respectively). However, it must be noted that some of the major recommendations of PSF are not followed in all the TBI offices. Market information related to CTC tea as well as green leaf price on monthly basis is not provided to STGs or respective associations or STG societies. The outturn percentage prescribed by the TBI for Tamil Nadu is also lesser, as shown in Table 19. In all, there is need for further fieldwork and research for estimating an alternative price-sharing formula.

TABLE 19: AMOUNT OF GREEN LEAF REQUIRED FOR MADE TEA IN NILGIRIS

August 2006

Name of BLF	Green leaf (in kg)	Made tea [CTC] (in kg)	Outturn percentage
Riverside Tea Plantations	242,861	60,094	24.74
Chamraj Tea Estate	503,552	123,487	24.52
Ripon Tea Factory	841,590	174,865	20.78
Sree Laxmi Tea Industry	248,367	62,125	25.01
Sree Shakti Tea Industry	227,400	56,916	25.02
Vigneswar Tea Estate	253,002	63,258	25.00
Sree Sasthaa Tea Factory	79,094	19,053	24.09
Rock Valley Tea Industry	176,997	45,120	25.49
Green View Tea Industry	207,441	51,874	25.00
Total	**2,780,304**	**656,792**	**23.62**

Source: Unpublished data collected from Tea Board of India, Kochi

Opinion of STGs, INDCO Factories, and Associations, and the Necessity of Price-Sharing Formula

- Minimum price of green leaf is assured if it is monitored and implemented properly

- Provide further research and improvement with available and continuous BLF-wise monthly data on pricing of CTC tea, outturn percentage, tea waste accrued, green leaf price paid to STGs, etc.
- Explore the possibility of redefining the outturn percentage of made tea
- Ample scope for new and innovative regulatory measures with regard to BLFs and better linkage to STGs
- Better transparency in the tea supply chain starting from the primary producer, through marketing, and finally to the consumer.
- Cost of production and cost of cultivation can be assessed through 'E' returns submitted by the factories (including CPFs, BLFs, and estate factories)
- Minimum support price for STGs can be formulated

11. Findings

- Very few STGs maintain their records on expenses and volume of green leaf from their gardens.
- Except INDCO cooperative factories and a few BLFs, most of the BLFs are not willing to share any kind of information related to their factories in respect of price paid for green leaf, cost of production and other expenses, etc.
- Cost of production varies across states and regions depending on productivity, efficient management, scientific agricultural practices, access to credit, interrupted flow of inputs, seasonal price variation at local level, and proper budget and planning among STGs.
- Cost of green leaf production is higher in seedling tea plants than in clonal tea plants as productivity is higher in the case of the latter.
- Fixing green leaf price is arbitrary, and STGs have no participation in fixing the price. BLFs have a strong lobby and monopoly over the green leaf market.
- At times, the cost of green leaf production is higher than the price realised by the STGs. The cost of green leaf production varies from Rs 7.00 to Rs 7.50 in Assam, Rs 7.00 to Rs 7.50 in West Bengal, Rs 6.50 to Rs 7.00 in Tamil Nadu, and Rs 8.00 to Rs 8.50 in Kerala (this is based on excluding the cost of the owner's labour).
- Often, it is cited to the STGs that the green leaf price is related to the market price of made tea, but it remains hearsay only, as no documentary proof or market information is shared at the grassroots level or with the STGs.
- Leaf agents act as middlemen between STGs and BLFs, and an additional cost is borne by the STGs ranging from Rs 0.50 to Rs 2.00 for per-kilogram green leaf.
- Business linking of BLFs and STGs requires to be imbued with some standardised agreement at an all-India level by the Tea Board of India.
- STGs in Assam and West Bengal are paid Rs 6.00 to Rs 7.00 per kilogram of green leaf, while the average price of CTC tea ranges from Rs 65 to Rs 75 per kilogram of made tea.

In Tamil Nadu and Kerala, STGs are paid Rs 8.00 to Rs 9.00 per kilogram of green leaf, while the average price of CTC tea ranges from Rs 48 to Rs 55 per kilogram of made tea.

- BLFs officially allow leaf agents to deal with STGs as they find it comfortable to deal with a few agents instead of a large number of individual representatives of STGs.
- Very few BLFs in the states of Assam, West Bengal, Tamil Nadu and Kerala submit monthly 'E' returns to the Tea Board of India, though it is mandatory under Tea Marketing Control Order.
- Tea Board of India is also non-transparent in publishing the names of BLFs not submitting 'E' returns.
- The monthly average green-leaf price paid by BLFs to STGs is not published in the regional Tea Board offices.
- Monthly market information related to CTC tea and average green-leaf price payable by the BLFs are not shared with all stakeholders including local-level associations, STG societies and gram panchayats.
- Price-sharing formula is not implemented properly in all the states and regions. It is also evident from interaction with different regional Tea Board officials that the Tea Board of India does not maintain all records as per prescribed guidelines of Tea Marketing Control Order.
- In Tamil Nadu, 20,049 STGs with area of 31,848 acres are associated with INDCO CPFs, but STGs are not individually registered with Tea Board of India.
- In Kerala, STGs are organised under three societies: Peermade Development Society in Idukki, Wayanad Tea Producers' Marketing and Processing Co-operative Society, Sultan Bathery, and Wayanad Agro-Movement Tea Company Ltd, Mananthyvady.
- In Assam and West Bengal, STGs are fully dependent on BLFs, and the latter has monopoly over the green leaf market.

12. Analysis and Conclusions

It can be said that STGs are not keeping regular accounts of their garden maintenance. Very few STGs across all the four states have information related to cost of green leaf production and garden management. While BLFs do not reveal actual data on cost of processing, it is estimated that it ranges between Rs 12 and Rs 13 for made tea/kilogram. In case of INDCO tea factories, it is slightly higher due to higher benefits paid to their employees; the cost of processing at INDCO units is Rs 14-15 for made tea/kilogram.

The business linking of BLFs and STGs needs to be guided by a standardised agreement at an all-India level, formulated by the Tea Board of India. The quality assessment for green leaf is arbitrary and varies from one state to another, and therefore, it is imperative to develop a standardised method of assessing green leaf quality by the Tea Board of India. The cost of processing of made tea by BLFs should provide the expenditure heads as calculated by INDCO tea factories, and Tea Board of India should formulate some regulatory measures in this aspect. State-wise price of

green leaf paid by the BLFs on monthly basis should be published in local newspapers in regional languages, for providing market information to the STGs and increasing transparency at the grassroots level. The primary producers, i.e., STGs, situated at the lowest order of the value chain should be protected from market loopholes through increasing awareness, data transparency and information dissemination by the regional Tea Board offices located in different parts of India.

13. References

ABITA Zone 1, Dibrugarh. *115th AGM Report*.Assam Branch Indian Tea Association. p. 25.

Baruah, G., Saikia, G.K., and Deka, A. Plantation Crops in North Eastern India: Constraints and Strategies. Working Paper, Assam Agricultural University, Jorhat.

Baruah, S., and Taparia, M. (2004). Small Tea Growers of Assam: Status and Strategies – Part-I. *The Assam Review and Tea News*. December 2004. pp. 10-18.

Baruah, S., and Taparia, M. (2004). Small Tea Growers of Assam: Status and Strategies – Part-II. *The Assam Review and Tea News*. January 2005. pp. 11-19.

Chairman, Tea Board of India, 2005. *Letter related to quality tea production*, circulated on 23.03.2005 to all BLFs Association in India.

Chairman, Tea Board of India, 2006. *Letter related to amendment of price-sharing formula*, circulated on 26.07.2007 to All Assam Small Tea Growers Association, Dibrugarh.

Department of Horticulture, Tamil Nadu. *Hill Area Development Report 2004*.

Deputy Director of Tea Development, Tea Board of India, Siliguri, 2006. *Letter related to minimum quality parameter for supply and procurement of green leaf*, 06.01.2006.

Kabir, S.E., 2002. Bought Leaf Factories versus Small and Marginal Tea Growers. *Letter to the Assistant Commissioner*, 23.04.2002, Jalpaiguri Division, Jalpaiguri.

Short Notes, 2006. Short Notes on INDCOSERVE and INDCO Tea Factories in Nigiris District, Coonoor.

Short Notes, 2006. Short Notes on the working of the Salisbury INDCO Tea Factory, Gudalur.

Short Notes, 2006. Short Notes on Wayanad Small Tea Co-operative Society, Chulliyode, Sultan Bathery.

Tea Board of India, 2001. *Techno-Economic and Socio-Economic Survey of Kerala Tea Industry*. Tea Board of India, Kolkata.

United Forum of Small Tea Growers' Associations (North Bengal), 2006. Short Notes on Uttarbanger Natun Cha Pata Utpadakder Kichhu Katha.

United Forum of Small Tea Growers' Association (North Bengal), 2006. Short Notes on Small Tea Growers of North Bengal.

www.nabard.org/roles/ph/tea.htm: Tea Plantation by Small Growers

www.indiateaportal.com

www.uttarbangasambad.com

14. Appendices

Annexure 1

Cost of Development of Tea Plantation

Source: HADP Report 2004

Cost of Establishment of One Ha of Tea Plantation

Sl no.	Item of cultural operation	Cost/ha (Rs)
1	Cleaning jungle growth	15,000
2	Felling trees, uprooting stumps, etc.	25,000
3	Levelling marking paths and drains	14,000
4	Soil conservation methods (revetments, drains, etc.)	23,000
5	Collection of pegs for marking	25,000
6	Lining	3,000
7	Pitting	5,500
8	Cost of plants @ Rs 3.5 for 13,000 plants & transport	50,000
9	Planting	7,000
10	Cost of shade plants @ Rs 2.5 for 260 plants	650
11	Mulching @ Rs 10/kg for 26 tonnes/ha	5,000
12	Pitting and shade plants	720
13	Spreading of mulch material	2,400
14	Misc. expenses	2,000
	Total	**155,770**

Cost of Maintenance of Field in the First Year since Planting

Sl no.	Item of cultural operation	Cost/ha (in Rs)
1	Sub-soil irrigation	3,000
2	Centering	500
3	Cost of manure	
a)	Cost of NK mixture 1000:500 NK	12,000
b)	Rock phosphate	3,000
4	Cost of application of manure	
a)	NK mixture	500
b)	Rock phosphate	1,000
5	Tipping	500
6	Weed control	
a)	Manual weeding 4 rounds 15 workers/ha/round	3,000
7	Pest control 4 rounds	
a)	Cost of pesticides	1,500
b)	Cost of application	1,000
8	Blister blight control 8 rounds	
a)	Cost of fungicides	1,000
b)	Cost of application	500
9	Soil conservation	
a)	Cleaning drains and staggered trenches	500
10	Misc. expenses	2,000
	Total	**30,000**

Cost of Maintenance of Field in the Second Year since Planting

Sl no.	Item of cultural operation	Cost/ha (in Rs)
1	Tipping (25% of the area only)	1,000
2	Plucking 20 rounds @ 10 labour/round	10,000
3	Cost of manure	
a)	Cost of NK mixture 1200:600 NK	15,000
b)	Rock phosphate @ 90 kg P_2O_5	3,000
4	Cost of application of manure	
a)	NK mixture	1,500
b)	Rock phosphate	1,000
5	Zinc sulphate: Cost of application 5 rounds	1,000
a)	Cost of chemical 11.25 kg/ha	1,200
6	Centering (infill)	500
7	Weed control	
a)	Cost of chemical	2,000
b)	Cost of application	500
8	Pest control 6 rounds	
a)	Cost of pesticides	2,000
b)	Cost of application	500
9	Blister blight control 8 rounds	
a)	Cost of fungicides	2,000
b)	Cost of application	500
10	Misc. expenses	2,000
	Total	**43,700**

Cost of Maintenance of Field in the Third Year since Planting

Sl no.	Item of cultural operation	Cost/ha (in Rs)
1	Plucking 25 rounds @ 13 labour/round	16,250
2	Cost of manure	
a)	Cost of NK mixture 1500:500 NK	16,000
b)	Rock phosphate @ 90kg P_2O_5	3,000
3	Cost of application of manure	
a)	NK mixture 6 applications	1,500
b)	Rock phosphate	1,000
4	Weed control	
a)	Cost of chemical	2,000
b)	Cost of application	500
5	Blister blight control 8 rounds	
a)	Cost of fungicides	2,000
b)	Cost of application	500
6	Misc. expenses	2,000
	Total	44,750

Cost of Maintenance of Field in the Fourth Year since Planting

Sl no.	Item of cultural operation	Cost/ha (in Rs)
1	Plucking 30 rounds @ 16 labour/round	2,400
2	Cost of manure	
a)	Cost of NK mixture	15,000
b)	Rock phosphate	3,000
3	Cost of application	
a)	NK mixture applications	1,500
b)	Rock phosphate applications	1,000
4	Zinc sulphate	
a)	Cost of application	1,000
b)	Cost of chemical 11.25 kg/ha	1,200
5	Weed control	
a)	Cost of chemical	2,000
b)	Cost of application	500
6	Pest control 6 rounds	
a)	Cost of pesticides	2,000
b)	Cost of application	500
7	Blister blight control 8 rounds	
a)	Cost of fungicides	2,000
b)	Cost of application	1,000
8	Misc. exp.	2,000
	Total	**56,700**

Cost-benefit Ratio

Cost Incurred in First Seven Years (in Rs)

Expenditure in planting year	155,770
Expenditure 1st year since planting	30,000
Expenditure 2nd year since planting	43,700
Expenditure 3rd year since planting	44,750
Expenditure 4th year since planting	56,700
Total	330,920
Expenditure 5th year since planting	56,700
Expenditure 6th year since planting	56,700
Expenditure 7th year since planting	56,700
Total	**501,020**

Benefit Realised through Green Leaves

Parameter	Kg/ha	Rs/kg	Amount (in Rs)
Tea green leaf yield 2nd year since planting	5,000	8	40,000
Tea green leaf yield 3rd year since planting	7,500	8	60,000
Tea green leaf yield 4th year since planting	12,500	8	100,000
Tea green leaf yield 5th year since planting	12,500	8	100,000
Tea green leaf yield 6th year since planting	12,500	8	100,000
Tea green leaf yield 7th year since planting	12,500	8	100,000
			500,000

Annexure II

Cost of Development of One Ha Tea Plantation in Assam
(Eastern Plains, Brahmaputra Valley)
(Amount in Rs)

Particulars	Year-wise cost of development					
Year	1st	2nd	3rd	4th	5th	Total
Total man days	1,092	283	190	180	175	1,920
A. Cost of labour @ Rs 71.80 per man day	78,406	20,319	13,642	12,924	12,565	137,856
B. Material cost						
i) Shade material	1,478					1,478
ii) Planting materials @ Rs 2.61 per plant for 15,000 plants	39,009	3,901	1,950			44,861
iii) Plant protection chemicals	123	246	615	923	1,230	3,137
iv) Weed control chemicals			456	684	912	2,052
v) Fertiliser/micronutrients	1,495	2,990	5,981	2,856	2,856	16,178
vi) Organic matter	2,460					2,460
vii) Mulching material	1,800	600				2,400
Total of B	46,366	7,737	9,002	4,463	4,998	72,566
Total cost (A+ B)	124,772	28,057	22,644	17,387	17,563	210,423
Rounded off to	124,770	28,060	22,640	17,390	17,560	210,420

Source: Tea Plantation Development Scheme (1-4-2002 to 31-3-2007)

Cost of Development of One Ha Tea Plantation in West Bengal

(Eastern Plains, Dooars and Terai)

(Amount in Rs)

Particulars	**Year-wise cost of development**					
Year	1st	2nd	3rd	4th	5th	Total
Total man days	1,092	283	190	180	175	1,920
A. Cost of labour @ Rs 71.80 per man day	77,860	20,178	13,547	12,834	12,478	136,896
B. Material cost						
i) Shade material	1,478					1,478
ii) Planting materials @ Rs 2.60 per plant for 15,000 plants	39,009	3,901	1,950			44,861
iii) Plant protection chemicals	248	496	1,240	1,860	2,480	6,325
iv) Weed control chemicals			447	671	894	2,012
v) Fertiliser/micronutrients	1,495	2,990	5,981	2,856	2,856	16,178
vi) Organic matter	2,460					2,460
vii) Mulching material	1,800	600				2,400
Total of B	46,491	7,987	9,619	5,387	6,231	75,715
Total cost (A+ B)	124,351	28,165	23,166	18,221	18,708	212,611
Rounded off to	124,350	28,170	23,170	18,220	18,710	212,620

Source: Tea Plantation Development Scheme (1-4-2002 to 31-3-2007)