Chapter 7

Dependence of large tea estates on small tea plantations as a source for outsourcing of green leaf and its impact on their production and productivity performance –A study with reference to North Bengal tea industry

7.1Introduction:

Whenever people discuss the issues relating to tea industry they usually refer to large tea industry and we are used to considering the phenomenon of the emergence of the small tea gardens and its viability, the economics, and social contribution as a sector independent of the sector comprising with large estates.On the other hand, it has been alleged by many, particularly in media, that the emergence of small tea gardens is a source of the present crisis in the large tea estate industry.Thus inter-relationship between these twosectors have become a major issue. Because of this, without verifying the existence of inter-linkages between these two sectors, the inspection of small tea gardens and its economics can not be complete. It is needless to say that if the dependencies between these two sectors are a two-way phenomenon, then the present economic state of affairs ofthe large tea estate sector is to be understood with respect to the commercial relationship of small tea gardens.In connection with the investigation of reasons behind the closing down a number of large tea estates in North Bengalalong with the inquiry on their economic viability, we think that the probing of this aspect may be helpful for both the wings of the tea industry. With this in view, we undertake this chapter to have a preliminary insight on this aspect of the tea industry.

As far as the region of North Bengal is concerned, the tea industry is the only organized industry which provides benefits to more than a million of people in terms of both direct and indirect employment. In fact, the industry could appropriately be termed as a lifeline industry of the North Bengal region from the perspective of regional economic development. Till the1980s the tea industry was by and large consisted with only one sector – the organized or traditional sector. But this scenario of the single tea production stream had come under a significant transformation since the early 1990s with the advent of a new sector –the unorganized or the new plantations sector. With the onset of a tea price boom during themid-1990s, many small farmers started taking up tea cultivation on a large scale (The ITA-Newsletter, Vol.20 No. 9&10, 2002). The identification of ruling attractive tea prices as a proximate determinant for the propping up of

small growers in the mid-1990s is exactly matched with our finding being arrived at independently in chapter 3 wherein an analysis of small tea growers profile is discussed at length. Subsequently, there has been an unprecedented proliferation of small tea growers in this region. Following this development, the West Bengal tea industry could now be characterized by the co-existence of twin production streams− the organized sector consisting of tea estates and the unorganized sector consisting of new plantations along with Bought-Leaf Factories (BLFs). The size of new plantations varies from very small to large. The importance of this unorganized sector in tea industry of the region can be better understood by looking at the following table showing the behaviour of production, labour, and land during 1990-2013.

Table7.1.Change in production, labour and land between 1990 and 2013

Year	index of growth (production)	Index of growth (labour)	Index of growth (land)
1990	100.00	100.00	100.00
2000	121.22	101.93	106.24
2010	153.44	105.36	113.76
2013	166.66	105.66	138.82

Source: Tea Statistics, Various issues, Tea Board of India

The above table shows that the production has increased by more than 66 percent while the land area has registered a growth rate of around 39 percent between 1990 and 2013. The employment growth rate in the organized sector, however, has stagnated at about 6 percent over this long period. What is primarily contributing to achieving significant rates of growth of production and the land area seems to be the rapid growth of new plantations during this period. The abysmally low rate of employment growth is plausibly an indication of stagnating trends of growth of production as well as tea acreage in the organized sector. It is relevant to mention here that tea Board of India had prepared a perspective plan in the 1980s for achieving the production target of 1,000 million kg by the year 2000. This target could not have been achieved till 2011. It,

therefore, seems quite obvious that reaching out the target of one-billion-kgmark is largely attributable to the contribution made by the unorganized sector to the total tea production of the country.
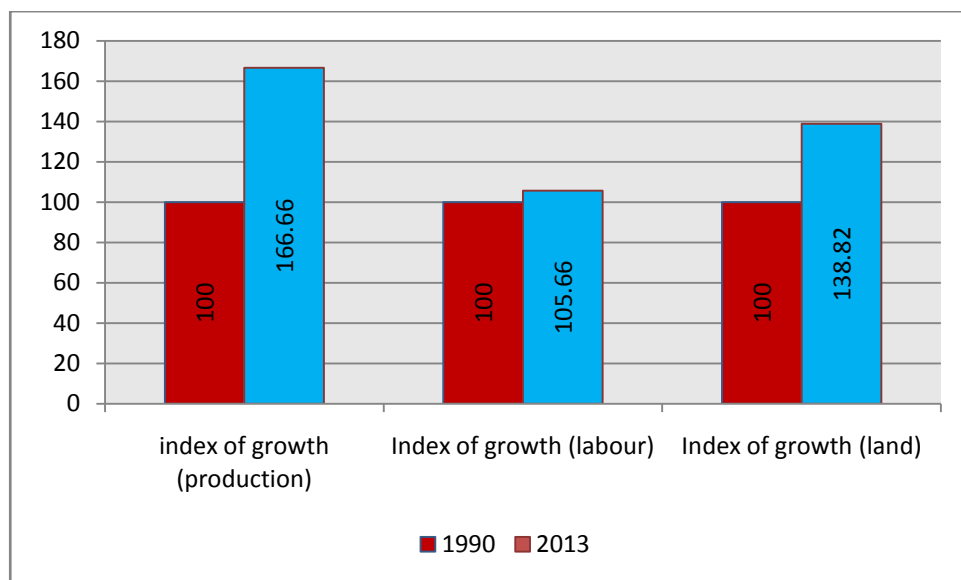

Figure7.1 Changes in production, labour, and land during 1990-2013.

Changing profile of Small Tea Growers vis-à-vis the Organized Sector

The changing profile of small tea growers at the all India level between 1991 and 2001 could be traced out from table 7.2

Table 7.2 Small Growers Profile

Parameters	1991	2001	Cu. Growth rate (%)	Share in All India (2001)
No. of Holdings	33713	115000	13.24	-
Area Under Tea (Hec.)	25108	101000	14.93	19.73
Production (M Kg)	53	170	12.53	19.91
Labour Employed	66000	230000	13.3	18.67

Source: The ITA Newsletter, Vol.20 No. 9&10, 2002

The information contained in the above table exemplifies that, over a period of 10 years, there has been a 3.5 times increase in the number of holdings of small growers, four times increase in the area under cultivation by them, over three times rise in production and about 3.5 times increase in employment. The registering of the cumulative growth rate of 13.3 percent for labour employed provides us with an ample proof of high employment generation potential underlying this sector. In comparison to this, the cumulative growth rate of labour employed in the organized sector could be found to be far lagging behind, if not declined during this period. The contribution of this sector was about 20 percent of the total tea production in 2001. Though the small growers' sector had flourished uninterruptedly at a remarkable pace since 1991 and onwards, the organized sector had to suffer a setback in terms of decline in growth of production to a considerable extent towards the end of the given decade. As reported in ITA Newsletter (2002), during a span of three years from 1998 to 2001, tea production by the organized sector had decreased by 3.9 percent in North India, by 4.7 percent in South India and 4.2 percent all-India. In contrast, tea production by the small growers' sector had increased by 35.9 percent in North India, 9.2 per cent in South India and 20.6 percent all-India. This gives ample reason to assert that the production gap of tea in India is evidently mitigated by the increasing contribution of the small grower's sector.
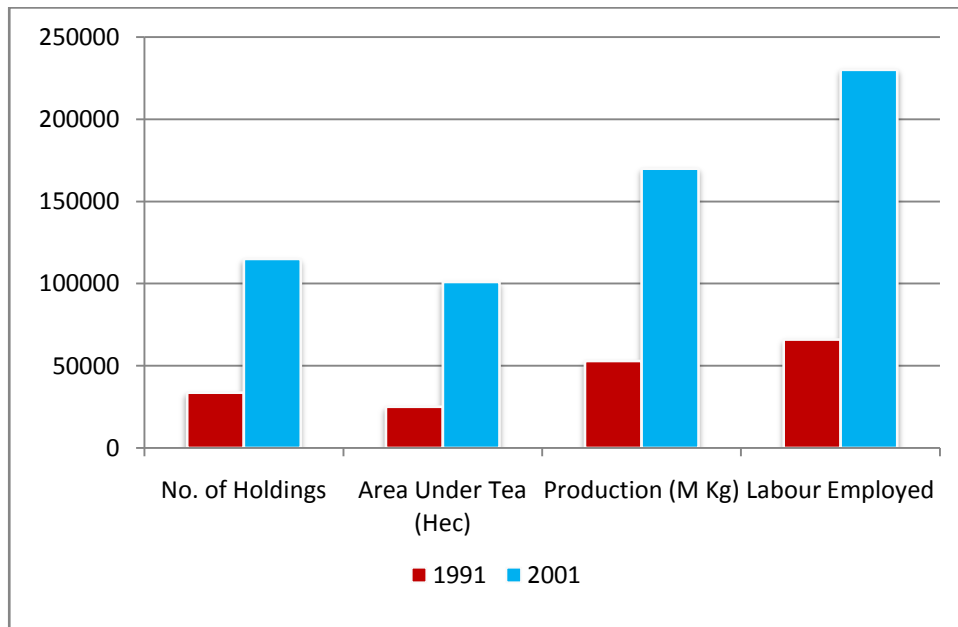

Figure 7.2. Profile of Small Growers

It is important to mention in this connection that the ITA, the largest body of tea planters in North India, along with other planters' organizations has often proclaimed that the major area of concern over the operation of small growers sector is the poor quality of its produce. This causes a considerable quality comprise of tea produced by small grower-BLF sector. Because of this, this sector is able to dispose of their produce at very low prices. This adversely affects the organized sector through depressing the overall market price of tea. These concerns hardly have any substantial basis due to the fact large tea estates having an affiliation with such planters' bodies are now heavily reliant on small tea growers as an alternative source of supply of green leaf, irrespective of their much-touted concern over low-grade green leaf depressing the quality of tea. Ironically, all these planters' bodies had all along supported the small growers' sector in terms of lending technical inputs and free advisory services to them so as to facilitate them to prosper.

7.2 Objective of the Study

As mentioned above, since the1990s the tea industry in West Bengal has been gradually restructured to take a dichotomous character wherein both the organized and the unorganized sector comprising of new tea plantations, small tea plantations, and bought-leaf factories now co-exist. Though initially, these two sectors were operating independently, but over time the interdependencies among these two sectors have been seen to increase enormously. One important dimension of this interdependency phenomenon is the outsourcing of a basic input of production, namely, tea leaf, outside of the organized sector. This feature of leaf procurement from small tea plantations is well spread in the all the tea growing regions of West Bengal where the tea plantations of the organized sector are situated, namely, Darjeeling Hill, Terai, and Dooars. Among these three regions, the number of tea estates is highest in the region of Dooars (148), followed by the Darjeeling Hills (80) and the Terai (45). Given this scenario, the present study is an attempt to make a critical assessment of the nature and extent of dependence of large tea estates on small tea plantations in terms green leaf outsourcing and the likely impact of such dependence on their productivity level measured in terms of yield per hectare. A linear regression analysis is used to evaluate the impact of sourcing dependence on the productivity of plantations within the organized sector

7.3 Extent of Leaf Outsourcing

Apart from its independent contribution to total tea production of the State, the unorganized tea sector is also contributing indirectly to total tea output by way of helping large tea estates to outsource a substantial portion of their green tea leaves. This linkage between the two sectors can be understood in a better way by looking at tables 7.3& 7.4

Table7.3. Extent of Leaf Sourcing within the Organized Sector

Region	Share of output produced from own leaf (%)		Share of output produced from sourced leaf (%)		(+)/(-)
	2010	2011	2010	2011	
Darjeeling Hills	95.9	96.2	4.1	3.8	-0.28
Dooars	64.6	61.9	35.4	38.1	2.74
Terai	32.5	22.0	67.5	78.0	10.47
All	56.3	48.0	43.7	52.0	8.31

Source: Survey of tea gardens, 2014, State Labour Institute, WB

Table 7.4.Gardens Employing Leaf Sourcing

Region	Leaf Sourcing Gardens (No.)	Leaf Sourcing Gardens (No.)	Leaf Sourcing Gardens (%)	Leaf Sourcing Gardens (%)
	2010-11	2011-12	2010-11	2011-12
Darjeeling Hills	17	19	21.25	23.75
Dooars	84	85	56.76	57.43
Terai	36	35	80.00	77.78
Total	137	139	50.18	50.92

Source: Survey of tea gardens, 2014, State Labour Institute, WB

Tables 7.3 and 7.4 show, respectively, the extent of leaf sourcing in production operation in percentage terms and the number and percentage of gardens resorting to leaf sourcing on a region-wide basis. As table 7.3 shows, the percentage of output produced from sourced leaf in Dooars over the periods 2010-11 and 2011-12 were 35.4 percent and 38.1 percent, respectively. This means there has been a marginally rising tendency of leaf sourcing in the region between these periods. The shares of output produced from sourced leaf were remarkably high in both periods under study in the Terai region. The percentage figures calculated to be 67.5 percent and 78 percent, respectively. This means that nearly two-third of outputs was being produced from purchased leaves in this region. Moreover, there has been a sharp increase in the use of sourced leaf to the tune of 10.47 percent between the study periods. Notably, the extent of sourcing in the Terai region is nearly twice as high in comparison to the Dooars region. However, the common pattern to be observed in production behaviour of gardens in both regions is the increasing reliance on sourced leaf so as to complement total production. Overall, the use of sourced leaf has increased from 43.7 percent in 2010-11 to 52 percent in 2011-12.

Table 7.4 shows that the percentage of garden sourcing leaves in Dooars during 2010-11 was 56.76 and during 2011-12 it was 57.43 percent which constituted more than half of the total gardens in the region. In Terai, the percentage of gardens sourcing leaves is the highest. During 2010-11, it was 80 percent of the total gardens and it was 77.78 percent during 2011-12. The percentage of gardens depending on sourcing of leaves in the Darjeeling region has been found to be about 21 percent in 2010-11 and this has increased further to about 24 percent in 2011-12. Overall, it is found that out of 273 gardens in total across the regions, it is around half of the gardens that were found to be sourcing leaves during 2010-11 and 2011-12.

On the basis of the above analysis, it is found that the leaf sourcing feature is quite significant in both the regions of Dooars and Terai with the latter region dominating the former region. Following this development, a big share of total output of tea in the organized sector is being produced from leaf purchased from these new plantations. However, in the case of Darjeeling Hills region, this effect is found to be marginal in terms of production share but it is quite crucial in terms of a number of leaf sourcing gardens.
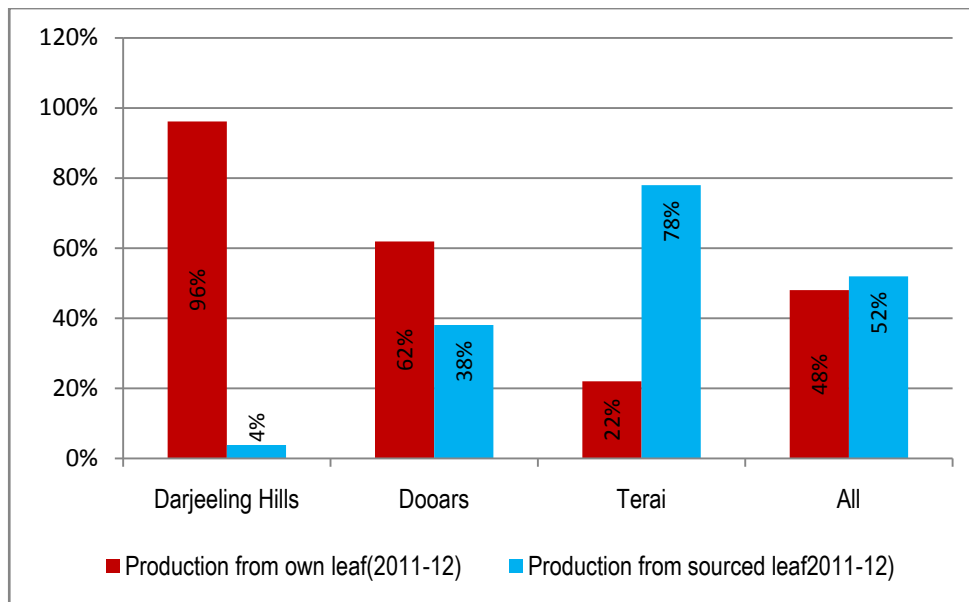
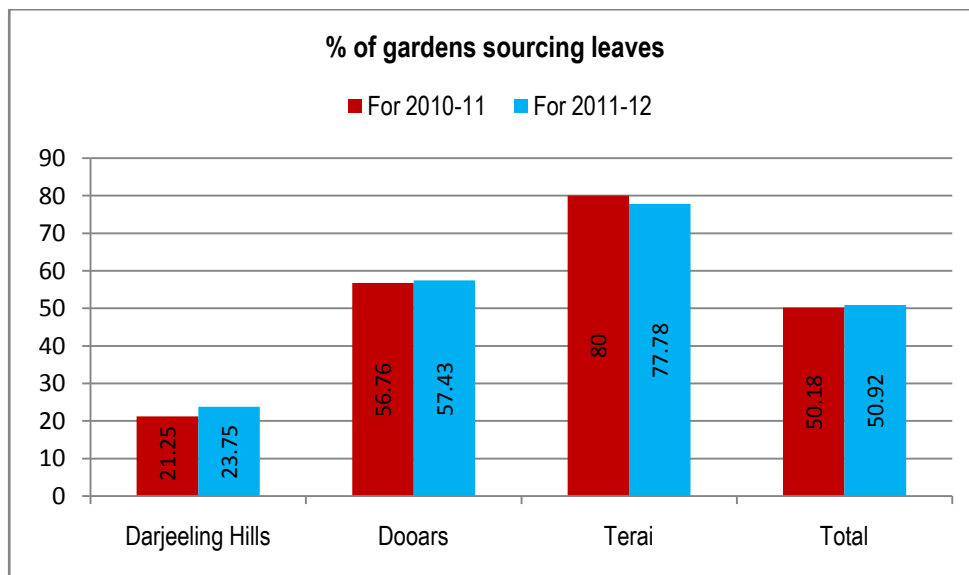Figure7.3 Break-up of tea production according to type of green leaf

Figure7.4Percentage of gardens resorting to leaf sourcing in the tea growing regions

As the tea industry has shown a strong tendency towards leaf procurement from small growers, we now make an attempt to assess in quantitative terms the impact of such trend of leaf sourcing on the productivity level of tea estates using linear regression analysis as described in the following section.

7.4 Regression Analysis

7.4.1 Regression Model

For assessing the relative contributions of different input components (including leaf sourcing) towards productivity of plantations in the organized sector, the following general linear regression model is specified

$$Y_i = \beta_0 + \beta_1 PLPH_i + \beta_2\, CLPH_i + \beta_3 D\_Source + \beta_4 D\_Region + \beta_5 D\_Operating\_Status + U_i$$

where Y_i represents yield per hectare of the ith tea estate; $PLPH_i$ and $CLPH_i$ represent permanent labour per hectare and casual labour per hectare, respectively, employed by the ith tea estate; D_Source denotes the dummy for leaf sourcing, which is equal to 1 if the garden resorts to outsourcing and otherwise 0; D_Region denotes the regional dummy, which is 1 if the tea estate is situated in Darjeeling Hills, and 0 otherwise (if it is situated either in Terai or Dooars); $D\_Operating\_Status$ denotes the dummy for operating status of an estate, which is 1 if the garden is subject to uninterrupted operating and 0 otherwise (if it operates with interruptions like temporary shutting down). Finally, U_i is the stochastic noise term and assumed to be distributed as $-U_i \sim iid\ N(0, \sigma_u^2)$.

The regression analysis for the present study has been done in three steps. In the first step, the model is fitted to data covering all regions. For this analysis, the variable $D\_Operating\_Status$ is dropped out as this problem is not very a pertinent one across all the regions. Next, the model is fitted to data for the Terai region. Like the analysis done in step one, the variable $D\_Operating\_Status$ is also dropped out in this case for similar reasons. Finally, the regression equation has been estimated for the Dooars region after including the dummy variable $D\_Operating\_Status$ in the model for the reason that the problems of closure and abandonment of gardens are rampant in this region in the recent past. It is to mention here that no estimation exercise is carried out for the Darjeeling region separately as leaf sourcing, as well as labour actualization, are not found to be quite prominent in this region.

7.4.2 Data and Sample

The study utilized the secondary data obtained from West Bengal Labour Department's tea garden survey. This is an exhaustive survey of all the 273 tea estates giving tea estate specific detailed information on tea production, utilization of land and labour and other related tea statistics. For the estimation of region-specific and all-region regression equations, some tea estates are not included in the sample due to the inadequacy of data on them. For the all-region analysis, a sample of 266 gardens is used while for the analysis pertaining to each of the Dooars and Terai regions, the samples consist of 140 and 39 tea estates, respectively.

7.4.3 Analysis of Regression Output

The results of the linear regression models fitted to the cross-section data covering all regions vis-à-vis the regions of Terai and Dooars are shown below in tables 7.5,7.6 & 7.7.

Table 7.5 Estimated regression model for all regions

Variable	Coefficient	Std. Error	t-Statistic		Prob.
(Constant)	1069.970*	102.706	10.418		.000
PLPH	119.063*	43.725	2.723		.007
CLPH	266.774*	41.725	6.375		.000
D_Source	254.106*	63.927	3.975		.000
D_Region	-957.172*	73.172	-13.081		.000
R-squared		.593	F	Sig.	
Adjusted R-squared		.587	95.047	.000	

∗Significant at 5 percent probability level

Table 7.6 Estimated regression model for the Terai Region

Variable	Coefficient	Std. Error	t-Statistic	Prob.
(Constant)	447.360	200.217	2.234	.031
PLPH	314.395*	103.339	3.042	.004
CLPH	444.286*	103.687	4.285	.000
D_Source	651.607*	143.062	4.555	.000
R-squared		0.555		
Adjusted R-squared		0.523		

∗Significant at 5 percent probability level

Table 7.7 Estimated regression model for the Dooars Region

Variable	Coefficient	Std. Error	t-Statistic	Prob.
(Constant)	506.154*	231.835	2.183	.031
PLPH	494.099*	108.227	4.565	.000
CLPH	199.718*	93.405	2.138	.034
D_Source	196.597*	93.404	2.105	.037
D_Operating_Status	415.839*	124.118	3.350	.001
R-squared		0.302		
Adjusted R-squared		0.282		

∗Significant at 5 percent probability level

The results of the linear regression models fitted to the cross-section data covering all regions vis-à-vis the regions of Terai and Dooars show that the R-squared values of all the models are quite satisfactory. For all-region and the Terai, these values are found to be 0.59 and 0.56 respectively, which are quite robust. For the region of Dooars, the R-squared value is estimated to be 0.30. All regression coefficients have also been found to be statistically significant, at 5 percent probability level or below, with positive signs for all independent variables except for the variable D_Region which takes on a negative value. For this dummy variable, the reference category is Darjeeling hill which happens to have the lowest average yield among all the three tea growing regions. The negative coefficient of D_Region indicates that on an average the yield of Darjeeling gardens is lower to the tune of 957 kg. in comparison to those located in Terai and Dooars.

The regression results relating to leaf sourcing indicates that it has impacted the productivity of tea estates in a large way in all locations of the tea gardens. The sourcing dependent gardens have an average additional yield of 254 kg./ hectare in absolute terms in comparison to non-source dependent gardens. Thus, the gap is quite substantial. This seems to explain why a substantial part of total production in the organized sector is now contributed by sourced leaf, that is to say, leaf purchased either from new plantations or from small growers or both. Sourcing has led to substantial productivity improvement in the organized sector of tea economy of West Bengal.

It can be noticed that there is a huge difference in sourcing coefficient for the Terai and Dooars regions, which are estimated to be 651.61kg./ hectare and 196.60 kg./ hectare, respectively. Thus, the coefficient of sourcing for the Terai region is more than thrice as high in comparison to the Dooars region. Thus, leaf sourcing has tended to exert the highest influence on the production as well as productivity of tea in the Terai regions relative to all other regions.

With reference to the Dooars region, one important finding of the study relates to the contribution of the variable D_Operating_Status to the achievement of yield per hectare. For this variable, the reference category has been defined to be the uninterrupted operating of the garden during the period of study. The alternative category is taken to be 'operating with interruptions due to temporary shutdown'. In absolute terms, the coefficient of this dummy variable has been found to be 416 kg./hectare. This implies that the well-operated gardens have an additional yield of 416 kg./hectare large in comparison to the gardens with interruptions in operation.

The Yield Gap Problem and Leaf Sourcing

It is highly probable that the easy availability of sourced leaf has come to appear as a recovery measure to halt the problem of declining bush productivity due to the older age of tea bushes. Whenever the ageing problem sets in, the productivity of tea bushes gradually reduces thereby enforcing total production to fall perpetually. Generally, bushes over 50 years old are considered as exceeding economic threshold age limit and tend to be commercially unproductive. There is sufficient citation in the literature that older plantations in all the tea growing regions of the State have been afflicted with the problem of decline in productivity over the last couple of decades. This problem has also been brought into notice by Indian Tea Association (ITA). In its pre-budget memorandum for the period 2012-13, it has been pointed out that "50% of the standing tea bushes are over the 50 years age bracket compared with an all India average of 38%. This would underline the urgent necessity for undertaking programmed Replanting towards addressing the problems of old aged bushes and thereby improving both productivity and the quality profile of West Bengal teas. This requires the tea industry to remain economically viable with sufficient surpluses towards re-investment in both field and factory". Thus, there is no denying the fact that the law of diminishing returns to yield seems to be well set in all those plantations. Moreover, with the sneaking of ageing problem, the degradation of the quality of tea is inevitable to occur. This productivity downturn problem could have been averted, as it is

underscored in ITA's memorandum, had there been capital investment at an optimal level for uprooting/ replanting and rejuvenation so as to replace the older bushes with the younger ones. In the absence of any significant amount of such productivity-enhancing capital expenditure, the gardens are now faced with the two-pronged attacks – the lower realization of yield and deterioration of the quality of produce. Thus, just to maintain total production at the level as before (if not increased), some alternative means was urgently sought to compensate for declining bush productivity. The outsourcing of leaf seems to appear as a useful means to eliminate the yield gap problem.

Cost Saving and Leaf Sourcing

Besides eliminating the yield gap problem, another explanation for resorting to leaf sourcing may be the cutting back on the cost of production of tea. The small growers' sector has the comparative cost advantage in the production of green leaf on at least two counts−very young age profile of tea bushes that yields an abundant quantity of green leaf and a high dose of use of family labour that leads to substantial saving of labour cost of production. This comparative cost advantage of the small growers sector is also coming to the benefit of tea managements in the organized sector in terms of providing them with a cheap source of supply of green tea leaf. Thus, leaf sourcing is essentially working as an effective cost-saving mechanism that pushes up profit margin to a significant extent. Given this scenario, the prop up of small growers as an alternative production structure of the State's tea economy could have been thought to be largely promoted by the existing estates.

7.5 Conclusion

The study seeks to focus on the emerging trends of production and productivity of the organized tea sector of West Bengal in the aftermath of inception and extension of small growers sector. One such trend has been observed to be the sourcing-dependence of a large number of older tea estates on small tea growers. The results of regression analysis reveal that the yield achievement of the tea estates, particularly in the Terai and Dooars regions, is significantly dependent on leaf-sourcing in recent times. There are two possible explanations for this result. The first possible explanation is that the outsourcing of leaf seems to appear as a useful means to improve the production and productivity levels vis-à-vis upgradation of the quality of tea. Secondly, the means of procurement of leaf from small growers has been adopted on the ground of cost

efficiency. The cost of production of green leaf to the small growers is of lower magnitude in a considerable extent as compared to that incurred in large tea estates. This interdependence among the organized and unorganized sectors of the tea industry has the beneficial effect of increasing the aggregate tea output on a sizeable scale, thereby gradually redressing the supply shortfall problem in the domestic tea market. The inter dependencies are, however, reciprocal in the sense that the small gardens also get benefit of additional market of their green leaf.