

## Technological gap in adoption of scientific practices of tea cultivation by small tea growers

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### Abstract

*The study was conducted in Sonitpur and Biswanath districts of Assam with 100 Small Tea Growers to determine the extent of technological gap in adoption of scientific practices of tea cultivation and to identify the problems in production and marketing of green tea leaves as perceived by the small tea growers. Majority (71%) of the respondents had medium overall technological gap in adoption of scientific practices of tea cultivation followed by 17 per cent respondents with low overall technological gap. The findings also revealed that practice wise maximum average technological gap was found in adoption of doses of YTD mixture (70.90%) followed by size of planting pit and number of ploughing and harrowing with average technological gap scores being 61.71 and 57.21 per cent respectively. The three most important problems faced by the small tea growers in production of green tea leaf in order of importance were scarcity of labour followed by incidence of Tea Mosquito Bug in green tea bushes and lack of knowledge regarding organic tea cultivation. From study it was clear that massive capacity building programmes should be undertaken to develop knowledge and skills on scientific practices of tea cultivation of STGs and concerned agencies/ organizations should put more efforts in accelerating the adoption of scientific techniques of tea production.*

Keywords: Technological Gap, Small Tea Growers (STG), Problems, Assam

### Introduction

Tea is one of the oldest and well organized industries in India and it plays an important role in the national economy. India is the second largest producer of tea (1116 million kg) in the world after China (Arya, 2014). Within the tea producing countries, the small tea growers (STGs) play an important role world-wide. In India, an estimated 160000 small-holders accounted for over 26 per cent of its production of 1116 million kilograms. Moreover, there has been an enormous growth of small growers as compared to the large-scale organized sector in the past three decades. The advent of a large number of small tea growers in recent years is a significant development in the tea industry and socio-economic sphere of Assam. According to

All Assam Small Tea Growers Association (AASTGA), there is 1, 18,832 STGs spread across the state and their cultivation area is estimated at 2.50 lakh hectares. These small tea growers produced 8820,594,234 kg green leaf during the year 2014-15. In 2014, STGs provided 170 million kg made tea, contributing 33.00 per cent to the total production of the state and 28.00 per cent of the area. An analysis of the small tea production system is the quite important to the subject of development of the small tea growers as well as improving the productivity tea on small holdings. Choosing policies for development of STGs requires the use of information about the situation existing in the small tea gardens. Keeping these facts in view, the present study was undertaken with the following objectives.

1. To determine the extent of technological gap in adoption of scientific practices of tea cultivation by small tea growers
2. To identify the problems in production and marketing of green tea leaves as perceived by the small tea growers

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## Methodology

A purposive-cum-random sampling technique was followed for selection of 100 respondents which constituted the sample for the study. The study was conducted in Sonitpur and Biswanath districts selected at random under North Bank Plain Agro Climatic Zone of Assam. A total of 50 respondents were selected from Tezpur sub-division of Sonitpur district and another 50 respondents were selected from Biswanath sub-division of Biswanath District. Only those small tea growers who had a minimum of 1 ha of land under tea cultivation were considered for inclusion in the sample of the study. The data for the study were collected by the personal interview method with the help of a structured research schedule.

Technological gap in adoption of scientific practices of tea cultivation among the small tea growers has been conceived as the difference between the recommended tea practices and the actual adoption of these recommended practices in tea crop. Technological gap for scientific practices of tea was calculated by adopting the procedure followed by Das (2013). The technological gap was calculated for 19 selected scientific practices of tea as recommended by Assam Agricultural University and Tea Research Association, Tocklai Experimental Station, Jorhat, Assam. The data related to adoption gap in a particular practice of tea cultivation was obtained as follows.

Gap in the practice

$$= \frac{\text{Deviation from the recommended practice}}{\text{Recommended practice}} \times 100$$

The scoring for each gap under each practice was done accordingly. Thus, if a respondent has 100 percent gap in a certain practice, his score will be 10 for that practice. Based on the mean ( $\bar{X}$ ) and standard deviations (S.D.) of the obtained scores, respondents were classified into three categories as shown below:

Categories	Score range
Low technology gap	Up to (-1.S.D.)
Medium technology gap	(-1.S.D.) to (1.S.D.)
High technology gap	Above (+1.S.D.)

In attempting to identify the problems as perceived by the small tea growers, the respondents were asked open-ended questions to mention the most important problems they were facing in production and marketing of green tea leaves. The problems were then ranked on the basis of percentage of respondents reporting each problem. Only those problems which

were reported by at least 20.00 per cent of the respondents were taken into consideration

## Results and Discussion

### *Extent of technological gap in adoption of scientific practices of tea cultivation*

The distribution of respondents according to their overall technological gap in adoption of scientific practices of tea cultivation is shown in Table 1. It revealed that majority of the respondents (71%) had medium overall technological gap in adoption of scientific practices of tea cultivation followed by 17 per cent respondents with low overall technological gap in adoption of scientific practices of tea cultivation. A small percentage of them (12%) were found with high overall technological gap in adoption of scientific practices of tea cultivation.

Table 1: Distribution of respondents according to overall technological gap in adopting of scientific practices of tea cultivation

Technological gap category (Score range)	Number	Percentage
Low overall technological gap (0.00 to 37.75%)	17	17.00
Medium overall technological gap (37.76% to 44.57%)	71	71.00
High overall technological gap (44.57% to 100.00%)	12	12.00
Total	100	100.00
Mean	41.16	
S.D	3.41	
C.V	8.28	

The overall mean technological gap score was 41.16 per cent indicating medium extent of overall technological gap in adoption of scientific practices of tea cultivation in the sample of the study. The value of co-efficient of variation (8.28) indicated that respondents were highly homogenous with respect to their extent of overall technological gap in adoption of scientific practices of tea cultivation.

### *Practice wise average technological gap in adoption of scientific practices of tea cultivation*

A perusal of the Table 2 reveals that there was substantial extent of technological gap in adoption of scientific practices of tea cultivation by the small tea growers. The maximum average technological gap was found in adoption of doses of YTD mixture (70.90%) followed by size of planting pit and number of ploughing and harrowing with average technological gap scores being 61.71% and 57.21% respectively.

Table 2: Practice wise average technological gap in adopting of scientific practices of tea cultivation

S.No.	Practices	Av. technological gap(%)
1.	Planting material	13.90
2.	Time of planting	16.61
3.	Spacing	23.90
4.	Time of vegetative propagation	32.60
5.	Number of ploughing and harrowing	57.21
6.	Size of main drain	36.10
7.	Size of planting pit	61.71
8.	Dose of chemical weedicide	38.80
9.	Length of pruning cycle	48.90
10.	Height of light prune	49.70
11.	Time of light prune	41.41
12.	Height of centering	48.00
13.	No of plucking round	27.00
14.	Chemical pest control	48.40
15.	Interval of irrigation	43.41
16.	Dose of YTD mixture	70.90
17.	Mulching Practices	48.11
18.	Dose of chemical pesticides	37.81
19.	Procedure of green leaf handling	37.80
	Overall mean technological gap	41.16

There was substantial extent of technological gap in adoption of scientific practices of tea cultivation like height of light pruning (49.70%), length of pruning cycle (48.90%), chemical pest control (48.40%), mulching practice (48.11%), height of centering (48.00%), interval of irrigation (43.41%), time of light pruning (41.41%), doses of chemical weedicide (38.80%), doses of

chemical pesticides (37.81%), procedure of green leaf handling (37.80%), size of main drain (36.10%), time of vegetative propagation (32.60%), number of plucking round (27.00%), maintenance of spacing (23.90%), planting time (16.61%) and use of planting material ( 13.90%).

*Problems in production and marketing of green tea leaves as perceived by the small tea growers*

The results obtained are presented in Table 3. ‘Scarcity of labour during peak season’ was the most important problem in production of green tea leaves as perceived by 82.00 per cent of the respondents. As the tea cultivation is labour intensive so during peak season, particularly during harvesting time (plucking), planting/ replanting and pruning, the demand for labour increases and for small tea growers, labour becomes scarce. Because of high wage rate, most of the skilled labourers are attracted toward large tea gardens and small tea growers cannot afford such higher wage rates due to their limited finance.

‘Incidence of Tea Mosquito Bug in green tea bushes’ was ranked second important problem in production of green tea leaves as perceived by 79.00 per cent of the respondents. Most of the respondents reported that Tea Mosquito Bug (*Helopeltis theivora*) was the most important among the tea pests causing damage to their tea plantation. The adult and nymphal stage of Mosquito Bug causes damage of serious nature to the tea plantation. The nymph and adult insert their proboscis into the young leaves, buds and tender shoots

Table 3: Problems in production and marketing of green tea leaves as perceived by the Small Tea Growers

S. No.	Problems	Number of growers	Rank
<b>A. Production Problems</b>			
1.	Scarcity of labour during peak season	82(82.00)*	I
2.	Incidence of Tea Mosquito Bug in green tea bushes	79(79.00)	II
3.	Lack of knowledge regarding organic tea cultivation	75(75.00)	III
4.	Lack of knowledge on scientific tea cultivation	50(50.00)	IV
5.	Lack of land patta to avail incentives/facilities given by TBI	44(44.00)	V
6.	Lack of cooperation from bought leaf factories	32(32.00)	VI
7.	Lack of opportunity for training on scientific tea cultivation	29(29.00)	VII
8.	Threat from stray animals	26(26.00)	VIII
9.	Erratic climate factors	24(24.00)	IX
10.	High cost of irrigation	21(21.00)	X
11.	High cost of chemical	20(20.00)	XI
<b>B. Marketing Problems</b>			
12.	Low price of green leaves provided by the factories	91(91.00)	I
13.	Lack of market information	37(37.00)	II
14.	Limited number of bought leaf factories	22(22.00)	III

\*Figures within parentheses indicate percentage

to suck the plant sap. The toxin injected through saliva of the pest causes the tissues around the punctured spot to dry and die. The affected portion becomes brown and later on becomes black. The leaves having many such black spots shrivel and eventually fall off. This results in reduction in production of green leaves by the small tea growers. 'Lack of knowledge regarding organic tea cultivation' was ranked as third important problem in production of green tea leaves as perceived by 79.00 per cent of the respondents. Keeping in view the increasing demand for organic tea in present day scenario, some of the respondents were interested to learn about organic tea cultivation as well as certification process. 'Lack of knowledge on scientific tea cultivation' was another important problem faced by the small tea growers in production of green tea leaves which was ranked fourth. 'Lack of land *patta* (deeds) to avail incentives/facilities given by TBI' was another important problem faced by the small tea growers in production of green tea leaves which was ranked fifth. The other problems faced by the small tea growers in order of importance were 'Lack of cooperation from bought leaf factories', 'Lack of opportunity for training on scientific tea cultivation', 'Threat from stray animals', 'Erratic climate factors', 'High cost of irrigation' and 'High cost of chemical' which were ranked from sixth to eleventh respectively.

As regards marketing problem, 'Low price of green leaves provided by the factories' was the most important problem in marketing of green tea leaves as perceived by 91.00% of the respondents. 'Lack of market information' was ranked as second important problem in marketing of green tea leaves as perceived by 37.00% of the respondents. 'Limited number of bought leaf factories' was ranked as third important problem in marketing of green tea leaves as perceived by 22.00 per cent of the respondents.

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