GROWTH AND PERFORMANCE OF SMALL TEA GROWERS IN GOLAGHAT DISTRICT OF ASSAM

A THESIS SUBMITTED TO
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Certificate

This is to certify that the thesis titled ***"Growth and Performance of Small Tea Growers in Golaghat District of Assam"*** submitted by **Mr. Anitabh Kakoty** for the award of Degree of Doctor of Philosophy in Commerce under Nagaland University embodies the record of original work carried out by him under my supervision. He has been duly registered and the thesis presented is worthy of being considered for Ph.D. degree.

The research work has not been submitted for any degree of any other university.

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Declaration

I, Mr. Anitabh Kakoty, bearing Registration Number PhD/00139/2017, hereby declare that the Thesis entitled ***"Growth and Performance of Small Tea Growers in Golaghat District of Assam"*** is a bonafide research work carried out by me under the supervision of **Dr. Ratan Kaurinta**, Associate Professor, Department of Commerce, Nagaland University for the ward of Degree of Doctor of Philosophy in Commerce on fulfillment of minimum criteria laid by the University.

I, further declare that this thesis has not been submitted elsewhere for the award of any degree or diploma. Due reference have been made wherever anything has been referred to or cited in the proposal.

Place: KOHIMA (**ANITABH KAKOTY)**
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At the completion of my research work, I would like to dedicate this to my parents.

DATE: (ANITABH KAKOTY)

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LIST OF ABBREVIATIONS

AASTGA	**All Assam small tea growers association**
AITTA	**All India Tea Traders Association**
ANOVA	**Analysis of Variance**
BG	**Big Growers**
CAGR	**Compound Annual Growth Rate**
CCP	**Critical Control Points**
CISTA	**Confederation of small tea growers Association**
CTC	**Cut Tear Curl**
CV	**Coefficient of variation**
FAO	**Food and Agricultural organization**
FPO	**Food Processing Organization**
FPC	**Food Processing Company**
HACCP	**Hazard Analysis and Critical Control Points**
HSD	**Honestly Significantly Different**
ILO	**International Labour Organization**
IPCC	**Intergovernmental Panel on Climate Change**
KMO	**Kaiser Meyer Olkin**
K M test	**Kolmogorov Smirnov's test**
KTDC	**Kenya Tea Development Corporation**
LE	**Large Estates**
NETA	**North East Tea Association**
SD	**Standard Deviation**
SG	**Small Growers**
SHG	**Self Help Group**
STG	**Small Tea Growers**
TBI	**Tea Board of India**
TMCO	**Tea Marketing Control Order**
TRA	**Tea Research Association**
UPASI	**United Plantation Association of South India**

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CHAPTER I

INTRODUCTION

1.1 OVERVIEW

The importance of 'tea' as a beverage goes along with the food in the category of basic need. The world is highly attached to the 'tea' as a beverage after water which is considered as the most popular beverage. The cultivation of tea is highly privileged after its discovery as a popular drink which carries a number of attributes that makes it as an indispensable part of the daily life of human life. The expansion of tea industry along with its contribution towards the economy has a special space and for tea growing region. It is blessed as a cash crop which provides livelihood for a number of household.

"Camellia Sinensis" which is commonly known as tea is one of the most popular consumed drink all over the world originated in Asia. Now a days, Tea is grown in almost all countries in South and South East; India (Mahanta,2020). China is the world leader in tea production which accounts for 2.5 million tones of tea produced with a world share of 35 percent of total production. India is second largest producer of tea followed by Srilanka and Kenya.Assam which is the largest tea growing part in India considered tea to be the "green gold" and cultivation of tea is a matter of pride for the nation. It was rightly quoted by Arthur Wing Pinero, " While there is tea, there is hope".

Robert Bruce has found this plant in the year of 1823 which has drawn this milestone of Indian tea till today. Before that in early part of 19th century, tea had only one plant species which was known as Camellia Sinensis Var. Sinensis grown in mainland China. Robert Bruce tried an expedition and discovered the traditionally grown tea in the place of "Sinpho" tribe of the extreme North East corner of Assam to the border of Arunachal Pradesh and Peoples Republic of China. Under the patronage of Charles Bruce, small sample of tea was prepared with indigenous tea seed plants and was finally approved by then the Viceroy Lord Auckland. The indigenous plant was given a new scientific identity and classification as Camellia Sinensis Variety Assamica. Finally the tea made of the Assamese bush was auctioned in London Auction centre in May 1838.

Gradually, the tea gardens at different point of time have grown into size with a socio-economic impact and development of tea growing culture. The tea industry is vertically integrated to the system of manufacturing of tea starting from tea growing to its processing, auction market, warehouses, and transportation of it to the different markets across the world.

As per data of statista.com, world tea production has been growing at the rate of 5.8 percent from 2011-2019. As per Global Market Report on Tea of 2019, the livelihood connected with the world tea production is over 13 million with 9 million small holder farmers.70 percent of global production comes from 8 million small holder farmers in Asia and Africa (Voora et al, 2019).Since independence of India, during the plan period the

growth of tea production is calculated to be 250% and acreages of tea is growing at the rate of 40%. The labour absorption of tea is estimated to be 40 percent.

Migration of labour for the valleys of Assam for tea plantation has completely changed the tea production landscape of the region which was earlier initiated under British colonial rules. As per Rana(2006), the number of labour employed in Assam Valley was 107,847 in the year of 1885 which has increased to 147,760 in the year of 1900 and the trend continued to become this industry as the largest employer of labour in the country with a characteristics of low wage.

1.2.1RECOMMENDATIONS BY VARIOUS COMMITTEES

Development of tea industry has undergone through different phases of recommendations made by various expert committees. The recommendations are forwarded as per need of time and looking into domestic and global scenario. In earlier version of recommendations, the large estates were flexible for the ex-garden sales to decide on whether to go through auction or direct sales which was to be monitored by Tea Board of India. The decision on sales should be taken on the basis of intrinsic advantages of the producers and buyers. The committee has recommended to prioritize the auctions sale of small planters to realize their proceeds in a speedy manner. Consumer marketing should be encouraged in packaged form rather than loss form of made tea.

1.2.2 RESERVE BANK OF INDIA'S COMMITTEE ON FINANCINGOFTEA INDUSTRY RECOMMENDATIONS

The Reserve Bank of India Constituted a committee for tea industry financing under Mr. K.B. Chore on 3rd October, 1980. The committee had investigated production, exports, domestic consumption, prices, marketing arrangements and bank finance. The committee had also identified the problems faced by tea gardens and difficulties in connection with targeted but from the Eighth Plan period.

1.2.3. TANDON COMMITTEE RECOMMENDATIONS

Tandon Committee on marketing submitted its report in November, 1978 and recommended to reduce the cost of selling of tea gardens. The committee recommended to narrow down the cost of ex-garden sales as well as the receipt of payment. The committee had also recommended to make the selling process, the bank lending and working capital and its finance and development needs of the customer.

1.2.4 PLANTATION ENQUIRY COMMISSIONS REPORT

The plantation Inquiry commission of 1956 had investigated the cost conditions of tea industry along with field, production, export, earnings in foreign exchange, employment and contribution to the national revenue. The committee also enquired the relationship between tea and fertilizer

industry, earnings in transports, tea industries contributions to the forest region and suitability of climate. It also estimated the capital structure.

1.2.5 VENKATACHALLAM COMMITTEE RECOMMENDATIONS

Venkatachallam committee of tea Auction has suggested some modification which has set a threshold of selling tea at 70 percent of production through auction.

1.2.6 RAMAKRISHNAYYA COMMITTEE RECOMMENDATIONS

Ramakrishnayya committee was formed to assess the working of the Tea Board and equip in a manner that it can reduce the problems connected with the tea industry. A forum was constituted for centre state relationship especially for co-ordinated decision on tea.

1.3. LITERATURE REVIEW

Tea has a significant contribution to the state's economy and the socio economic impact of Tea has been a great source of interest for different institutions and individual at different capacities ranging from academias, planners, administrations and policy makers. The researcher has consulted different scholarly articles, reports, books in regard to this study which can be helpful to understand the definition of concepts, draw models and build up the knowledge on background. The review done on the basis of existing literature can be summarized as below -

1.3.1 LITERATURE ON FINANCIAL PERFORMANCE

Burja et al, (2015) is in the opinion that agricultural sector companies can be better managed with strong decision making process. Performance recorded in economic terms provided direction for efficient and balanced functioning and can attain a position in competitive scale. The financial standards help in monitoring and evaluation of the activities performance. The financial decision provides direction on how to use financial resources and production factor. Financial performance should consider liquidity, solvency, efficiency and profitability which can work together towards a value added performance indicator. However, the study has further suggested that information in regard to financial domain should be sufficient to neutralize the risk that could increase the profit and bring quality in decision making. Financial health could be rightly effected through financial performance which should be managed by maintaining the return on revenue and expenses. Risk can be neutralized by controlling solvency and liquidity, efficient blend of activity and operations to safeguard profitability. The financial performance should be maintained by better investment on capital, good proportion of debt to Asset, better sales return and build up of adequate working capital. The concept of financial performance should bring success, results based on action and ultimate action. Financial position should be accompanied by better cash flow.

Vasko et al, (2018) has expressed in their study that performance equality of individual companies has to confidently deal with its

management structure. The results obtained in the business by a company have to be reflected through balance sheets, financial statements and income statements. A systematic monitoring over performance brings financial stability to the company. However, revenue and cost is highly important along with liquidity and profitability for agribusiness unit.

Madina(2013) has revealed in the study on financial performance of Agriculture that increasing efficiency of funding is important for financial prosperity .An improved financial management in agriculture increases the scope of better investment in the sector. Financial activity should contribute to form financial resources and it can be possible through collaborative approach. The financial principles should be rightly adhered for efficient management. An effective management of agricultural enterprises can bring stability and bring a financial growth which is constant. For a good financial performance, mobilization of resources should be ensured and the entity should have capacity to repay the obligation and the companies should be able to invest in new avenues with possibility of expansion and modernization.

Singh (2019) has revealed that determinants of financial performance is highly important for agricultural firms. Return on equity is important for agricultural firms which can generate return on investment. The determinants of financial performance can be size of the firm, higher growth, financial leverage, capital intensity of a firm and degree of exposure to uncertainty which develops return on assets.

Dunaway(2013) has identified in his study that financial performance can predict how stressed is a firm and derive a framework to work on a financial investment. Financial ratios are widely used to determine financial profitability stress due to financial decision and light on credit risk. For assessment of financial performance non financial parameters like soil conditions, year of farming, gross farm return, operations undergone in terms of acres, other non firm income, government policy type of crops and economic conditions is also adjusted. Return on equity is highly expected which would be beneficial to retain performance and a possible expansion can be managed.

Boehlje et al, (1999) has linked farm commodity prices and incomes to the financial performance in his study. Financial performance should also emphasize capacity building. It is dependent on the financial position which encompasses the parameters like total assets, total liabilities, owners equity, gross revenue, total expenses and non farm income. Financial performance can be measured by setting some benchmark so that it can be compared. The benchmark should be set to perform above average of the farm. It can also include the comparison between the current year and previous year. Benchmark can be variable and needs to be adjusted based on situation and time.

Atkotia (2005) has extensively studied the financial performance of the tea industry in which a sound financial position is expected which can be useful to appraise the financial strength of this firm. In this connection,

the study has stressed on evaluation of liquidity, stability and profitability of the firm which reflects financial efficiency. Financial performance should look into the cause and effect where the financial indicators are an intermediate measures. Efficiency is directed towards minimization of cost. Financial performance includes appraisal which touches past, present and future performance of a firm. Financial statement should have alignment with the objectives.

1.3.2 LITERATURE ON NON-FINANCIAL PERFORMANCE

Morten (2017) has opined in his studies that non-financial performance should be inclined towards economic reality and economic logic and at the same time it should not be alienated from the non-economic consideration. The growth strategy of the business should have parity with the profitability while a farm relies on non-financial performance. Non-financial performance cannot alone hold the strategy to make it a success and it should clear out the doubt on any ambiguity of strategy. Hence, the reflection on economic logic should be given a high priority. In this way, management should be open to inputs and should take a serious look at all its stakeholders starting from suppliers, bankers, auditors and other players. It is also possible that if the non-financial performance is given intense importance than the possibility may arise when the farmers may concentrate more on production that can create some blind spots which may diminish profit. Non-financial performance measure should be concerned

with the value adjustment with a limit on available resources which can ensure economically best employment of it. The operational definition of non-financial performance measure is the communication towards the people to precisely conceptualize the mind of the people about what they are expected to do. Most of the non-financial performance of the individual firm is self referential which means that they work in a closed system of decision making. But extreme reliance on non-performance measures sometimes blinded them which led them to lose capacity to explore the alternative possibilities and create affinity towards economies of scale by ignoring the underlying dynamics and cost considerations.

Kamilah and Zabir(2015) has identified that traditional method of performance measurement system(PMS) is more inward looking which donot count the qualitative factors. The earlier system of PMS has to face inaccuracy and misleading. The innovative management in accounting system has encompassed non-financial measurement system with introduction of operational performance which cover up additional information. Non-financial performance measures reveal the strategic focus which derives value and motivational inputs. In non-financial performance measures, it includes on time delivery and satisfaction component with greater weightage. It increases more focus on internal focus with its end-users. Non-financial performance measure increases with the company's size which can be applied in the situation of complexity in manufacturing so that a greater control can be achieved during a routine procedure. Non-

financial performance ensures higher participation of stakeholders in terms of responsibilities with a need for information to monitor and control the system.

Kotane and Kazmina-Merlino (2011) has stated on non-financial indicators that sometimes results from invisible resources which can be intangible assets that can measure the business activity and in scientific terms it is known as intellectual capacity. The non financial performance has both advantages and disadvantages. The main advantage lie in the identification of cause- effect links. The choice and accuracy of non-financial indicators is important as the absence of it may lead to erroneous situation. Non-financial performance measure stresses on long term organizational strategies, quantify the intangible assets and build up better indicators for future financial performance with reduction to external noise. However, disadvantages in the non-financial performance can be due to time and cost, lack of causal links and inability to establish statistical reliability while too many measures can make it complicated to integrate the whole system.

Purves et al,(2015)in their study has highlighted on non-financial measures for agricultural companies with their specific industry skill and experience. Specific industry qualifications and experience should also be added to the skills and knowledge. Learning curve should always be placed in order. Non-financial performance indicators should be combined with financial indicators for better warning predictor that can restrict the

organizational failure and their study has derived Integrated Multi-Measures (IMM) approach with Non-financial factors for agricultural sectors oriented towards financial success.

Omran. A Mohammed (2019) emphasized that the use of non-financial performance has to follow up quality strategy and specific investment is most important. The special combination of skills with strategy information should be disclosed to reduce any form of information asymmetry. Non-financial performance should deal with information asymmetry with a more focus on its end user. Voluntary disclosure on non-financial indicators increases credibility of firm which can enhance the quality with an objective of value maximization. The operating financial performance(OFP) tends to have a parallel movement with more availability of information of non-financial performance by maintaining a certain degree of quality standard.

Jonathan Low (2019) has signified that non-financial information supports better forecasting on such as strategic decision of market ,buy and sell decision and expert interest on customer and product related factors which could be market share, customer retention and marketing technique alongwith training, research and development, product development which works towards innovation and employee related factor like production, efficiency and empowerment of employee. Investment decision has a strong inclination towards non-financial factors that can be helpful in deriving financial performance in future. The study has set some non-

financial criteria such as quality of management, quality of products and services, strength of culture of organizations communicators and strength of market position. The study has mentioned that ignorance of non financial measurement can lead to the undervaluation of the organization.

Ghosh Dipankar (2012) and Wu Anne (2012) has stated in their study that financial performance doesnot provide an accurate earnings forecast and at that point of time, relevance of non-financial measures has higher importance based on greater external communication of non-financial information though it is difficult to standardize as it has different dimensions encompassing growth opportunities, strategy of firm and overall industry characteristics.

1.3.3 LITERATURE ON PRICE OF TEA

Sarah Besky(2018) has discussed the issues related to the tea price in Indian tea market is found to be resistant to create futures which makes auction market of tea is more of dependant on outcry brokers. Future market is not getting developed due to the missing of standard price and lacks infrastructure. The price composition of tea is based on “tacit knowledge” which can be blending of tea flavor. Geographical origin and method of production. tastes and valuation prices fluctuates dramatically over the years which is because of a season where grading of yield brings different prices as a result of processing and treatment.

Gunathiaka and Anand Tularam**(2016)** has identified that the price series of tea varies due to the presence of climatic variable such as high rainfall ,drought and outbreak of pest. At extreme climatic conditions with an inverse relationship between temperature and rainfall in major growing part of the subcontinent has impacted the tea price.Agricultural factors such as total harvest price ,price of competitive items and extent of cultivation alongwith fertilizer chemicals works as an explanatory variables which has direct relationship in shaping the production as well as price elasticities of supply.

Liu (2016) and Shao (2016) has analyzed Indian tea price based on ARMA Model by using forecasting model during a frame of time. The findings of the study shows that price of tea plays an important role in the supply and demand of tea price found to be affected by cyclical fluctuation which in turn regulates the supply and production of tea.

Mukhopadhaya (2014) in her study reviewed social costs involved in the managing of a tea garden. In this case an increasing social cost in tea sector has also effected the price of tea product .Social Cost includes the subsidised rations, workers welfare, medical and sanitation which is not present in the unorganized small tea holdings.

Kadavil(2013) has revealed that tea industry has two types of sale practices where one is taking place through auction and the other is taking place through direct marketing from the large estates whereas the function of auction is similar by nature but for the direct selling it varies as per

choice of the producers and the prevalent rule of sales made through interactions between sellers and buyers .Auction has been the principal determining price mechanism as per practices under the provisions of tea marketing control which has a direction to follow up the stipulated seventy five percent to undergo through tea auction. As auction reduces time and encourages competition and can be determined through testing of samples. Price realization mechanism on the sale proceedings and price determination takes place through various interactions of producers ,Brokers, Warehouse keepers and buyers. The buyers always has a tendency to quote the price at lower point but the tea price is always fixed which depends on quality/grade of tea, market demand and export potential.

Krishnarani (2013) has identified the reason for huge fluctuation in price of tea is weather conditions geographical conditions and pest attacks.

Asopa (2007) has cited the price variability of tea in terms of consumer price . It is found in the study that consumer price variability is less as compared to the other consumable substitutes whereas he has indicated that price variability of coffee is thirty percent as compared to the two percent of tea.Stable price of tea brings high consumer loyalty.The worldwide value of tea is more important than its volume of production and exports. Earlier version of more production orientation needs to be replaced by market orientation with an emphasis on quality with cost leadership.

Roy(1968) in his study has discussed three types of price production movement based on Cobweb movement which may be purely periodic movement where a certain lag between anticipated price and supply is present.Damped periodic movement where the price and production are at very close point to reach equilibrium and antidumped movement diverge oscillatory situation which might grow to more unstable where price can reach to be absolute zero or production is completely abandoned.In this case demand has to be less elastic.

1.3.4 LITERATURE ON COST OF TEA

Mahindapala,K(2012) has cited in his study that because of inappropriate usage of inputs and lack of proper knowledge for different cost components ,the cost of production for tea is always high for small cultivators .The cost of production of tea should have better linkage of productivity ,management of land and uses of yield variety which can increase productivity by decreasing cost.

Damodaran,K(2011) has revealed in his study that farm size efficiency is important for cost minimization with higher yield while in terms of farm size efficiency, small farmers are in a more advantageous position than big farmers for tea.

1.4 SMALL TEA GROWERS IN DIFFERENT REGIONS OF THE WORLD

Tea Industry is a prominent industry in all tea growing country and small tea growers is an important segment across the world. As per Food and Agricultural Organizations(FAO) report, 2021, Sri Lanka has almost 400000 small holders with 76 percent of total product under tea cultivation. Kenya has 560,000 small holders with 62 percent of total products. In Vietnam, small tea growers constitute 43 percents of total area under tea cultivation. During the period of 2012, India the largest producer for black tea has 1, 60, 000 small holders which has over 26 percent of total production. Different countries have different definitions for small tea growers. In Kenya the small tea grower is that part of tea cultivation that does not have their own factory for the processing.

Srilanka considers small tea growers are those cultivators which have a cultivated land area less than 50 acres or 20.2 hectares. In India, small tea growers are traditionally those cultivations who have land acreage of 10.12 hectares and does not own any factory for processing of tea. Indonesia considers small tea growers are those segment of cultivator with cultivated land of between 0.8 to 2 hectares.

Small tea growers in different region of the world have same reason of emergence which is mainly due to possibility of work and income with low investment. The additional reason which is common in the low occurrence of crop failure which may be due to pest and calamities connected with this plantation.

Small tea holders are the produces which has a position at lowest level of tea production eco-system. Their responsibility is by and large is a management of the plantation after one time plantation with application of inputs, management of tea bush, soil and drainage maintenance and plucking and pruning in a recommended interval. The small tea holders product which is green leaves are less perishables products and plucked from geographically scattered areas which will be further integrated to processing units and respective markets for the final product.

1.4.1 SMALL TEA GROWERS IN KENYA

Tea farming in Kenya was started by a European settler named Mr. G. W. Cain who planted the first tea in Limuru area in 1903. Previously colonial government in Kenya restricted production of tea for restoration of the quality which was entrusted on large estates and multinational companies. After 1963, the Kenya Government implemented land reform which attracted the small holding farmers to participate in production of tea.

Kenya formulated a model where small scale farming of tea was placed under KTDA or Kenya Tea Development Agency. Gradually, under the initiative of KTDA, small holding of tea multiplied and now contributing more than 60 percent of total production of tea started from 1963. Small scale farming of Kenya has a percentage growth in terms of area (ha) and production (in kg) as 2,716 % and 61,279% calculated from

its year of initiation. The expansion in acreage has also registered growth in production.

Kenya Tea Development Agency, which is the major arm of the small scale tea farmers has established tea factories and continued to expand its capacities. The aim of KTDA is to utilize the increase crop volumes with efficiency without losing green leaves. However KTDA has taken strategic initiatives for better product values such as product diversification for black CTC type black orthodox tea variants, nutrient management in soil, making a sustainable agriculture with conservation of biodiversity and farm management service as per Report on Small-Scale Tea Sector in Kenya (2008).

It was the Swynnerton plan in 1954, which has entitled ownership of land to small growers which enhanced the intensity to produce cash crops and simultaneously provided an opportunity to the individual in the form small scale farmers for betterment of economic performance as indicated in the study of Thurston (1987).

1.4.2 SMALL TEA GROWERS IN SRILANKA

In Srilanka, tea or "Camelia Sinensis" was popular in nineteenth century and Scottish planter, James Taylor was pioneer in introducing tea plantation. Tea export has a strong presence in Srilankan economy. The Britishers who took the initiative of producing tea in Srilanka was instrumental in developing it to be the finest tea which is most commonly known as Ceylon tea in the world. In terms of volume, Srilanka is the

fourth largest producer of tea in the world. Srilankan tea is composed of major subscales where one part is known as corporate subscales or a large tea producers and the second one is small tea holders. In Srilankan, overall Green leaf production, the small tea holders produces almost 70 percent of total production which will be further processed into “made tea”. The small tea holder which has 1.5million dependent and number of factories almost 400 factories are relying on supply from small holder’s tea is predominantly of the size smaller than 0.5 ha. The green leaf collectors are at the midpoint of the supply chain according to the study conducted by Jeewanthi and Shantha(2021) .

As per International Labour Organizations report(2018), Small holders in Srilanka follow up three business models which can be identified as supply chain model, contract farming best model and best farmers cluster model. In the supply chain model, the small tea growers are characterized by lack of capital formation, small tea growers strong tie up with green leaf collectors, low in cash than which has strict binding on supply of green leaves and a very uncertain situation faced by the farmers. Under the control farming system, the stakeholders are the group of agribusiness firms, farmer collectives, organization formed by Government and financial institutions. The best farmer cluster model has to derive out the possible best practices who can become agent for change to increase productivity.

1.4.3 SMALL TEA GROWERS IN VIETNAM

Oanh et al,(2016) has cited that tea growing in Vietnam considers it as a staple crop and Phu Tho province in Vietnam, is contributing a reasonable portion of revenue to the Gross Domestic Product. It is viewed that, in 2014 the total tea area has acreage of up to 16,301 ha where output in 152,219 tons of tea leaves. Vietnam has experienced Doi Moi market reformers where small tea growers has important role in rural development. Vietnam followers the model of contract farming for tea sector in western Vietnam. The contractor supplies all the inputs along the management decisions and farmer supplies labour and land.

As per report of Centre for Community empowerment (2007) in Vietnam, the North East region which has a high altitude and temperate climate has suitability for tea farming. Earlier, Vietnamese market of tea was state controlled but increasing number of private players has expanded the market capacity through build up of more marketing channels. Contract farming which was introduced for the small tea growers has increased the quality and production of tea green leaves in Vietnam. The market intermediaries works between the firm and farmers.

1.4.4 SMALL TEA GROWERS IN DIFFERENT PARTS OF INDIA

Mishra et al,(2012)has noticed in their study that the tea acreage growth of tea plantations was highest in 1990's and it was due to the rising numbers of small tea growing business in India. Moreover, nontraditional

areas like Arunachal Pradesh, Manipur, Nagaland, Meghalaya, Mizoram, Sikkim, Odisha and a part of Bihar had also started adding in size of plantation to the tea industry. In addition to Assam like Tamilnadu who popularized the growing of tea gardens in small holding. It is viewed that the production of tea in Assam is sluggish due to the loss in yield potential. Production of tea industry in India is maintained due to small tea growers emergence in 1990s . As production is suffered due to various factors ranging from regulations in market , quality, soil fertility to climate the large tea estates used to take more calculative steps which impacted their production of raw materials.

Das and Saikia (2011) has started that it was due to the benevolent land revenue policy with a combination of continuous supply of labour that led to the multiplication of acreage during the British period.

Sivakumar(2020)has mentioned in their studies that the land of tea gardens are being utilized for different purpose such as real estate development which has resulted in fall in the acreage of tea garden in southern region of India leading to fall in growth of large estates.

Bhowmik (1991) has cited some important reasons in his study of growth pertaining to the small tea growers in comparison to the large estates .According to the study, the tea industry buoyed by some unique problems arising from the internal as well as external market. The price of the tea is always in an inclining trend which is due to the growing demand in both domestic as well as international market. Due to this nature of

supply side, the large estates needs to readjust its production estimate which is difficult for the large estates as they are facing different problems faced by them during the period of 1990 till 2015. He also cited the Tea Board of India report which revealed that the expansion of large tea estate was not a wise decision for them due to regulatory bindings and the board encouraged landless labourers and other employment seeking youths to join the stream of tea production. In this initiative, new segment of tea growers from small tea holders, landless labourers and unemployed youths are directly benefited. Being a populous country, the domestic consumption was ever increasing which is always around 60 to 70 percent of domestic production. The seventh plan has emphasized to make tea to the tune of 140.6 million kg amount whereas actual amount was 110 million kg. Tea board of India, during the period of 1990 also identified that adverse weather is condition adding decrease in production with a combined effect of old tea bushes of large estates which cannot hold proper yield. Tea Board of India .The report of year 1989 revealed that the 44 percent of tea bushes of large estates is 50 years old and 6.3 percent of planted tea bushes have an age of below 5 years. Instead of having cognizance to this internal situation, the Tea Board of India was exerting more effort on large estates which proved to be futile at the end. Because of this, the achieved target of replacement of tea bushes was only 30 percent. The small tea gardens received the impetus for promotional growth from the years under the eighth plan. During this plan period, Tea board of India has mapped the

possibility of expansion of tea gardens upto an acreage of 40,000 hectares out of which 25,000 hectares of land can be developed in North Indian belt and 5,000 to be added for tea plantation from South Indian region . The area that has been identified are mostly from the nontraditional areas where scope of tea growing in small holdings was high.

Hayami and Damodaran (2004) has found in their study that Small tea growers of South India has a major contribution of tea production in total production of India. South India is well known for various plantation for coffee, rubber, pepper and small cardamom and this region has a dualistic model of plantation in a large quantity of land which means that in one way plantation in a large quantity is being carried out by large entities inclusive of corporate houses and the small area holding of land is being cultivated by household farmers which is mostly ranging from half a hectare to three hectare plantation , the later format is being managed by family members with a limited number of temporary workers. By mentioning the study of UPASI (United Plantation Association of South India) which shows that tea constitutes 59 percent , coffee is at 28 percent and rubber is at 12 percent of the total plantation. The growth of small tea growers in South India is due to reason of being a family enterprise and needs lesser supervision to attain higher performance as compared to estates which are highly dependent on hired labour faces an added problem of high acreage and low monitoring ratio. As the fixed cost involved in large estate is high, it is hardly possible to take flexible decision on crop

rotation. Small tea growing in South India also received popularity due to existence of decentralized processing unit and ready market for sale of its product. UPASI 2004 (United Planters Association of South India) report reveals that 41 percent of small tea growers are contributing towards the total tea production in the region and members of STGs counted to be 99 percent of total tea producers.

As per study of Kumar (1998) in Himachal Pradesh ,the tea growing business is more of cottage industry. From the year of 1993 it could be found that 1508 estates of total 1660 estates which is almost 91 percent has an acreage of below 2 hectares with total acreage of 413 hectares and between 2-9.47 hectares of cultivated land of tea covering an area of 1440 hectares . Himachal Pradesh also shows stagnation due to frequent division of land caused by emerging nucleus family. In 2008, Kangra and Mandi Valley shows about 747 and 162 small growers are in operation. In North Bengal where the major concentration of small tea gardens has cited the growth of small tea growers in1980's due to mass adoption of tea cultivation in small holding by pineapple growers mostly found in the highlands.

Hannan (2007) has categorized the STGs in North Bengal as per the size of acreage, the firm band ranged between 0-5 acres are mostly family farm which is managed by members of family owned by women and children with lesser proportion of hired labour. The second category is the owner supervisory farm with a range between 5-15 acres which is owned

by individual owners with technical work schedule and financial aid run by the employment of hired labour and the third category is the staff supervisory farms of 15-25 acres of cultivated land and it employed Munsi (Multitasking) for technical advising and work employment with the duty of payment to hired labourers. Most of the STGs in the North Bengal come under category of multitasking system. During 2016 in West Bengal, the tea produced by the small tea growers reached to 154 million kgs of made tea which is 52 percent share of made tea produced by West Bengal initiated the growth of small tea gardens is the lack bottleneck in the form of market and credit availability, less perish ability and low storage cost.

1.5 PROFILE OF THE GOLAGHAT DISTRICT

Golaghat district is the fifth largest district in the state of Assam which is headquartered at Golaghat with 26.3185° N, 94.0907° E sharing a geographical area of 3502 sq. km. The latitude of Golaghat is 93016/ to 94010/ East and longitude is 25050/ to 260470 North. The district has 4 subdivisions which is namely Golaghat, Bokakhat, Dhansiri and Merapani. The district of Golaghat has been divided into 8 development blocks which are Dergaon, Bokakhat, Kakodonga, Sarupathar, Gomari, Marongi , Kothalguri and Podumoni.

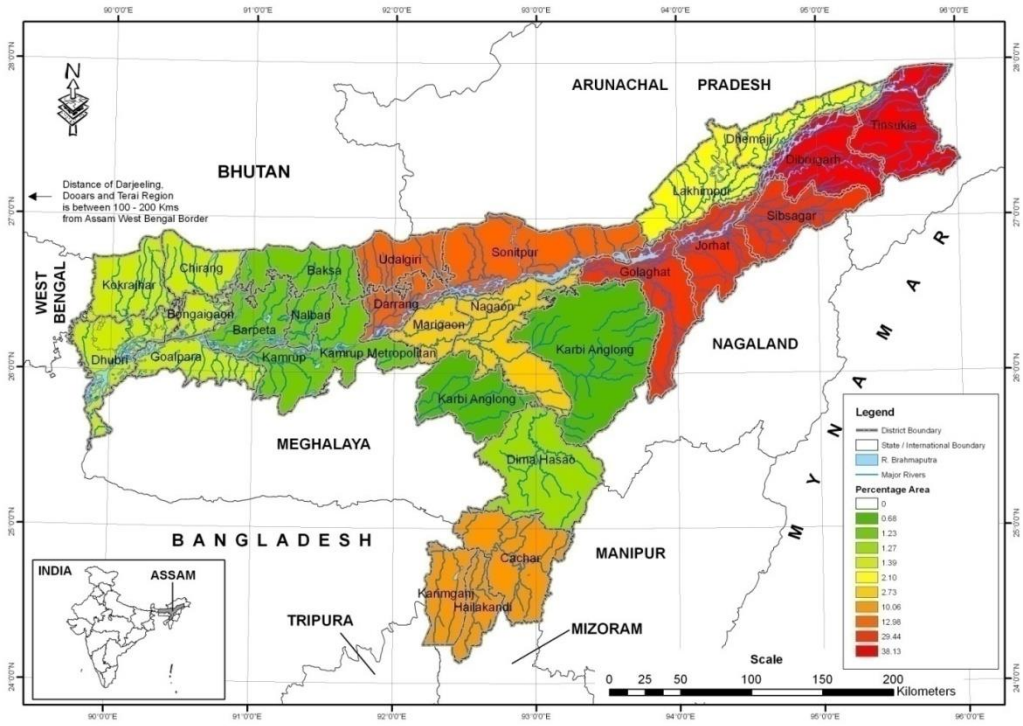
The river Brahmaputra is flowing to the North of Golaghat district with Jorhat district to the East Nagaon and Karbi Anglong at the west and Nagaland to the South. The principal river of Golaghat is Dhansiri. The district has the protected area where one is Kaziranga National Park and

Nambor Doigrung wildlife sanctuary. The Climate of the Golaghat district is hot and humid throughout the summer season accompanied by monsoon.

In Golaghat district,the total average annual rainfall is 1300 mm with two prominent months being June and July. The average maximum temperature is calculated to be 38 ^{0}C in June and 8^0 C as minimum temperature in December. Winter starts from November which is characterized by less rainfall and mists with afternoon temperature at 16^{0}C with morning at 8 ^{0}C.

1.6 AGROCLIMATIC ZONE OF TEA CULTIVATION IN ASSAM

Fig.1.1-DIFFERENT ZONES OF ASSAM



source- https://teaclimate.wordpress.com/growing-tea-in-assam/

As per division of agro-climatic zones ,the tea producing region of Assam has been divided into four districts known as Upper Assam, South Bank, North Bank and Barak Valley .The Upper Assam district of Assam comprises of Dibrugarh and Tinsukia, South Bank has Sibsagar, Jorhat, Golaghat and newly formed Saraideo district. North Bank has Nagaon, Sonitpur, North Lakhimpur, Morigaon and Darrang while Barak valley has Cachar, Karimganj and Hailakandi districts. The tea growing region shows high humidity and heavy rainfall during the summer season with a good tea production from March to November in the year. The elevation of the tea growing region is normally 45-60 meters and average rainfall is calculated to be 2500-3000 mm.

1.7 EMERGENCE OF SMALL TEA GROWERS IN ASSAM

In Assam, the emergence of small tea growers (STGs) has completely changed the tea production landscape. During the colonial period, various restrictions worked for growth in number of the gardens. In 1991, as per Tea Board of India estimates, the STG's had total land acreage in tea plantation was 2.6 percent of total area of tea plantation in India. But gradually, the STG's growth has increased to 28.1 percent of total acreage with significant decrease in the large tea estates in 2007. In Assam, especially Golaghat district took the lead for cultivation of tea in small holdings under the patronage of Janata Party Government rule in 1978. The minister of Agriculture at that period, late Soneswar Bora has encouraged the cultivators to start small tea holding venture. In 1987,

Golaghat district Small Tea Growers Association was formed for development of small tea growers. Small tea growers had the liberty to grow green leaves without restrictions and supply it to the nearby factories. The rampant rise of unemployment, prestige connected to the tea growing and existing tea growing culture accelerated the growth of the small tea growers in numbers, acreage and production level in the region. Different tea growing regions of Assam also followed the trend which had become a pattern for the state of Assam that led to the growth of the small tea growers in other districts of Jorhat, Dibrugarh, Sibsagar, Lakhimpur, Sonitpur, Darang, Udalguri, Nagaon, Cachar in Assam.

The estimates of 2019 by Tea Board of India regional office at Golaghat has found that the number of small tea growers registered with the Tea Board in Golaghat district is 130081 .On categorizing them into low ,medium and high STGs based on acreage which can be 0-5 ha,5-8 ha and 8-10.2 ha.It is viewed that 13033 or 99.6% percent are in the lower category,0.02% with 37 STGs in numbers are in medium category and 0.08% or 11 number of STGs are in higher catergory.Almost 70 percent of STG's are in the age-group of 25-40 years and 98% of the STG's are owned by male and only 2 % of the STGs are owned by female. According to AASTGA or All Assam Small Tea Growers Association ,Golaghat branch office,the actual number of small tea growers in Golaghat district is more than 15000,but they have the problem to get registered with Tea Board of India due to statutory reasons.

1.8 THE SURVEY

The survey was conducted with the aid of a structured questionnaire which was revised based on the findings of a pilot survey to make it more specific and favourable. The survey was conducted across the eight development blocks of Golaghat district of Assam to ascertain demographic, topographic and other economic status of the respondents mainly the small tea growers of the region. Golaghat district falls under South bank of agro-climatic zone and the local condition of the small tea growers is considered for the study with concentration on registered small tea growers of the Golaghat district. Productivity at different levels of plucking due to inputs, land acreage to labour utilisation, price and cost components connected to gross leaf production is taken into account for the study. The profile of the respondents can be summarized based on the survey as- The sample was drawn by using multistage random sampling from eight developmental blocks of Golaghat district. Golaghat district falls under the South bank agro climatic zone of Assam which has a sizeable number of small tea growers. It is viewed that across all blocks of Golaghat district, the responses has small or almost no variation and identified to be homogeneous in terms of structures and situation. The survey was undertaken with an intention to cover up the STGs registered under the Tea Board of India. It is seen that majority of the STGs in Golaghat is being covered by the Tea Board of India till 2020.Moreover, STGs which had land proprietorship issues for their total cultivated land are also undergoing registration for their part of the land with legal documents which has resulted more inclusion of STGs under Tea Board of India. In Golaghat districts, increasing awareness and expectation from this business

has motivated the STGs to register themselves under the Tea Board of India.

Table- 1.1RESPONDENTS PROFILE

I.ITEMS	**NUMBERS**	**PERCENTAGE**
No. of Respondents	400	100
STGs considered from different blocks	360	90
Responses from employees of large estates and bought leaf factories	40	10
II.LEVEL OF EDUCATION		
CATEGORY	**NUMBERS**	**PERCENTAGE**
Till matriculation	100	25
Matriculate	180	45
Graduate	80	20
Post graduate	40	10
III.OCCUPATIONDISTRIBUTION NUMBERS		**PERCENTAGE**
Service	100	25
Business	260	65
Homemaker	20	5
Others	20	5
IV.INCOME LEVEL(IN INR)		
CATEGORY	**NUMBERS**	**PERCENTAGE**
Below 50,000	20	5
50,000-1,00,000	100	25
1,00,000-2,50,000	80	20
2,50,00>	200	50
V.AGE GROUP(IN YEARS)		
AGE	**NUMBERS**	**PERCENTAGE**
Below 25	20	5
25-40	100	25
40-55	180	45
55>	100	25
VI.RESPONSES AS PER SIZE OF PLANTATION		
CATEGORY	**NUMBERS**	**PERCENTAGE**
Smaller sized STGs(0-5)ha	242	70
Medium sized STGS(5-8)ha	90	25
Higher sized STGs98-10.12)ha	18	5
V.DISTANCE FROM PROCESSING UNITS		
DISTANCE	**NO. OF STGS**	**PERCENTAGE**
0-5 km	324	90
5KM>	36	10
VII. WAY OF SELLING GREEN LEAVES		
Percentage of sellers who sells to agents	288	80
Percentage of seller who sell own their own	36	10
Percentage of seller who sell through SHGs	36	10

Source-From Survey

Respondents from the study was mostly drawn from the STGs from eight different blocks for a 360 degree result.To make the sample more representative out of 400 respondents, 40 respondents are selected from the employees of bought leaf factories and large tea estates which ensures more representations. Education level of the respondents shows that all respondents are high school pass with a sizeable number of respondents are having tertiary education. More number of respondents in the tertiary education indicates that this type of cultivation is adopted by educated youth with a motivation of entrepreneurship. It is viewed that 20 percent of respondents which are salaried person and service holder and 15 percent from varied background is participating in this business to ensure an alternative source of income. A small participation of housewives in this business also indicates its promising nature.

The income distribution from the respondents also shows that more STGs are in the middle income category or 65 percent are in that group. In Golaghat, small tea growers were showing growth from 1980s and during that period,a number of young aged people joined the system which is rightly reflected in the respondents age profile. It is viewed that almost 65 percent of the respondents of STGs are into the category of age group of 45 years and above. In terms of size of the plantations, most of the STGs are into the small size category of 0-5 hectares which has 70 percent of respondents.

Table-1.2 **TYPE OF LABOUR EMPLOYED**

CATEGORY	NO OF RESPONDENTS	PERCENTAGE OF RESPONDENTS
1.Hired labour for season	90	25
2.Casual labour	180	50
3.Family members and hired labours	54	15
4.SHG arrangement	36	10

It is observed that location wise most the STGs are within a radius of 5 km radius from their processing units which is due to higher number of bought leaf factories in the district. It is observed that most STGs prefers to sell their product to the collection agents which is the most popular mode. The direct selling to the processing units and selling through SHGs is relatively low. Most of the STGs engage casual labour on a wage contract based on plucking volume base wage which has 70 percent of the respondents.20 percent of STGs engage family members as well as hired labourers. Only 10 percent of STGs gets help from the SHGs arrangement.

Table-1.3AGE OF PLANTATION

CATGEORY(AGE WISE)	NUMBERS	PERCENTAGE
0-10	36	10
10-30	306	85
30>	18	5

The plantation age of the respondents shows that most of the plantations which constitutes around 85 percent of the STGs has economic bush into the age category of 10-30 years age. While 10 percent has young aged bush and 5 percent has old aged bush.

1.9 NEED AND IMPORTANCE OF STUDY

The industry of Assam is passing through a rough phase and emergence of small growers in Assam also has some limitations which is indicated in different studies .The performance of small tea growers both in physical and financial terms is important to ensure a balanced growth in the sector. It is also observed that small tea growers production level has to mainatian an optimal level beyond which they can face challenges to restore growth. It is established that small tea grower is significantly contributing to the economic growth of the region in Assam and can bring development. The performance of small tea growers could be rightly upheld by keeping a positive yield, more acreage and level of production. It is evident that in plantation segment the large tea estates of Assam is already lagging in terms of rejuvenation and replantation with other management issues. The small tea holdings is comparatively a recent phenomenon and it is important for them to overcome the drawbacks which has been facing by the large tea estates.The small tea growers adopted this cultivation as it is the most suitable alternative cash crop.The financial performance of small tea growers is highly important for cost management and profit generation which can further streamline the formation working capital to ensure a smooth operating cycle. The management decision in the small tea grower is crucial to bring sustainability which should also contribute to the welfare status of the tea growing community and create a

potential livelihood. The basket of plantation crops has number of options such as rubber, coffee and sugarcane .Among those plantations tea is most suitable for Assam looking into Economic, Demographic and Social background. It is widely accepted for its lesser perishable quality and perennial character .Moreover,an existence of strong marketing channel can add to better prospects of growth in case of small tea growers.

The small tea growers in Golaghat district of Assam bought a rapid transition in quality of life of the cultivators and changed the overall socio-economic pattern. The tea growing in small holdings has initiated this cultivation at their source of income by producing green leaves and people who participated in this process as a risk taker. A good number of educated youth has applied their knowledge and skill for its growth. The number of success cases has shown that one section of growers is adopting this cultivation as primary source of income and the rest of the cultivators taking it as primary source of income. The study on small tea growers is essential to derive a right policy for physical and financial well being of the small tea growers within a right time frame. It is essential to formulate the policy in a right way. It can also help the researchers ,policy makers and management professionals across the world which can also provide guidance to the entrepreneurs to set up a successful business unit.

1.10 OBJECTIVES OF STUDY

The overall objective of the study is to enquire into the growth and performance of Small Tea growers in Assam with special reference to Golaghat district. However, the specific objectives are identified as follows:

1. To review the overall scenario of Tea Growers in Assam with special reference to Small Tea Growers in Golaghat district.
2. To examine the institutional role for the promotion and growth of Small Tea Growers(STG's) in Golaghat district of Assam.
3. To analyse the non financial performance of Small Tea Growers(STG's) in Golaghat district of Assam.
4. To evaluate the financial performance of Small Tea Growers(STG's) in Golaghat district of Assam.
5. To find out the issues and challenges faced by Small Tea Growers in Assam and to recommend suitable suggestions for improving their performance.

1.11 HYPOTHESES

H_{01}: The performance of Small Tea Growers in Golaghat district is improving over the years.

H_{02}: The practice of contract price is not effective for increasing profitability of Small Tea Growers.

1.12 METHODOLOGY

The whole study is descriptive and analytical by character. The growth and performance of small tea growers of Golaghat district is emphasized with a comparative analysis with respect to the large tea estates and small tea growers in the state of Assam.The trend of production, yield, acreage, export and domestic consumption of tea is being considered and relationship is being analysed. The performance of the small tea growers in Golaghat district is being analysed with the help of selected indicators. The performance indicators is being divided into Financial indicators and Physical or Non-Financial indicators. The overall analysis is concentrated into the region of growth of Golaghat district of Assam. This study covered a time period of 10 years for the year of 2011-2020.An attempt has been made in this study to cover up all possible available data prior to the submission of the report.

1.12.1 DATA COLLECTION

The study is being undertaken with data utlisation from both primary as well as secondary sources. The primary data is collected through information gathered from the respondents belonging to the different groups which is comprised of small tea growers from eight developmental blocks of Golaghat district, employees of large estates and bought leaf factories within Golaghat district of Assam.The survey was conducted by

administering a structured questionnaire in relation to the research questions .

The secondary data sources are comprised of published reports of Tea Board of India,Statistical Handbook of Assam, NEDFI –data bank, Gauhati Tea Auction centre yearbook and Economic survey of Assam is being considered during the study. Apart from published sources ,data of statistical division of Tea Board of India ,AASTGA or All Assam Tea Growers Association alongwith various internet sources are being utilized.

1.12.2 SAMPLING DESIGN

The study conducted comprises of 400 numbers of respondents selected through multistage random sampling within the Golaghat district of Assam. However ,for analysis of factors responsible for production of tea ,the researcher has conducted survey for 400 number of respondents to avoid any biasedness with better sample adequacy.In this survey,information gathered from the population comprising of small tea growers,employees of bought leaf factories and large tea estates of Golaghat district .By applying multistage random sampling,selected respondents are from small tea growers and other respondents are considered from the employees of bought leaf factories and large estates .

`The descriptive part of the study is being sourced from the secondary data collected from the selected unit for this purpose .The interview scheduled was directed as a part of primary research and being analysed.The interview was administered with a schedule to find out the

status of the small tea growers at different point of time. The interviewed results of perception and satisfaction of small tea growers with different dimensions of institutional role is being analysed by administering specific questions. The consistency and reliability of data is being verified for different role dimensions of institutions categorized as administrative structure, financial inclusion, marketing activity and training and knowledge sharing. In this regard, a specimen questionnaire is being appended herewith. The secondary data are collected from various sources such as research and annual reports, journals ,edited books and published news in this respect.

1.12.3 DETERMINATION OF SAMPLE SIZE

The district of Golaghat comes under south bank agro-climatic zone. Small tea growers falls into the unorganized sector and a sampling frame of study is being taken for eight developmental blocks of Golaghat district of Assam. A multistage sampling framework has been followed to select the respondents of the study. In the first stage, an adequate number of small tea growers are selected from the district of Golaghat in the state of Assam. In the second stage, 400 number of small tea growers and employees of processing units comprising of bought leaf factories and large estate factories from the population. In the third stage, equal number of respondents from small tea growers and employees from processing units

from eight developmental blocks in equal numbers or 50 each from the developmental blocks is drawn to be selected as respondents.

The Golaghat district falls into the South Bank agro climatic zone and according to Tea Board of India Regional office at Golaghat, small tea growers have operation in almost all the eight developmental blocks in the district. Slovin's formula is being applied by looking into the population's behaviour or else it is difficult to include each and every member of population due to constraint of money and time. In the Slovin's formula, N be the population size and margin of error is 'e' which is the probability of committing an error in selecting a sample from the population. The formula can be: n= $\frac{N}{1+Ne^2}$

Hence,

Sample size n= $\frac{130081}{1+130081(0.05)^2}$

n ≈400,Where e=.05,N=130081

Source- Tea Board Of India Regional Office, Golaghat.

1.13 DATA ANALYSIS

Data obtained from the primary and secondary sources was classified and tabulated as per objectives of the study. In this study various

statistical tools and techniques are considered for measure of central tendency and measure of dispersion.

The analysis of growth is being undertaken using trend analysis and compound annual growth rate (CAGR),mean, standard deviation and Karl Pearson's correlation co efficient of correlation is used to analyse the variance and relationship.

Likert 7-point scale was used to measure the extent of responses in relation to the items on the questionnaires where- Strongly Agree (7 degree), Agree (6 degree), somehow disagree (5 degree), neutral (4 degree), somehow disagree (3 degree), disagree (2 degree) and highly disagree (1 degree).

To study the perception and satisfaction of the STGs,the reliability and consistency of different dimensions are being verified by using Cronbach's Alpha followed by Kolmogorov Smirnovs normality test with mean ,Pearson's R and standard deviation. Wilcoxon's sign rank test is applied after obtaining the result of normality test in relation to distribution of responses.

Analysis of performance was conducted by calculating CAGR, mean, CV, Adj. R^2 and by using Cuddy –Della –Valle instability index. Based on the result of normality test, t-test was utilized to measure the significance level. The technique of ANOVA, Tuckey's HSD test and Input –Output ratio was also used to measure labour productivity .Carli price

index and Jevon's index was used for price indices. Financial ratio analysis was used for liquidity, profitability and cost position of the STGs.

Principal component analysis was used for analysis of factors which effects production level of tea in Golaghat district of Assam on the basis of 7-point Likert scale which also identifies interrelationship between the variables.

1.14 LIMITATIONS OF THE STUDY

The entire study was based on both primary and secondary data sources. Secondary data sources are mainly drawn from the reports of Tea Board of India and Statistical Handbook of Assam .During the data analysis it was found that production level of small tea growers in Golaghat district for some years is not available for the reference period of 2011-2020 and at the same time yield and acreage data was also not published for some years which is difficult to extract. The export data for Assam tea was not published. The researcher faced a number of limitations during the study due to situations and problems due to working for an unorganized sector. However, a careful and constant effort has been made in collecting data from various sources in a more smooth manner.

During data collected from the primary sources , it was observed that a good number of respondents has certain reservations to provide data which was the part of objectives of the study. The respondents for example are not expressive in regard to their statutory position of the land holding or

do not share their form of land pattas .At the same time a good number of respondents are not maintaining their accounts in a standard format. Some respondents are also facing problems of information asymmetry in regard to factors effecting the production of green leaves.

Although researcher has faced some limitations, the responses obtained are satisfactory .The indicators derived for the performance of the small tea growers are limited to this study derived after several attempts has been made to encompass all characteristics.

CHAPTER II

SCENARIO OF TEA GROWERS IN ASSAM: AN OVERVIEW

2.1 INTRODUCTION

Tea is grown in some specific areas of India with prevalence of conducive factors such as tea growing regions are covered by monsoon shower, availability of soil with good proportion of nutrients, presence of foothills which can streamline the production of tea alongwith existing cultural practices for which the region embraces the production of tea. Generally for a profitable venture, the important ingredients which is necessary could be area, production and yield of tea, classification of tea falling in different zones which can be due to size of the tea garden or its distribution in terms of asset classification of tea bush pertaining to different age groups, scope of primary marketing with an orientation towards export demand is necessary .Area wise production of tea takes place in the states of Assam, West Bengal, Tamilnadu and Kerala and apart from these four states, tea is produced in smaller extent in Tripura, Karnataka ,Himachal Pradesh and Uttar Pradesh. As per the Tea Board of India report 2018, total area of cultivation for tea production in Northern Area is found to be 535629.04 ha whereas Tamilnadu West Bengal and Kerala has an area of 100928.03 ha tea plantation respectively.

Table- 2.1 STATE-WISE TEA GROWERS(INCLUDING BG AND ASSESSED SG)

Sl no	State	Big Growers		Small growers		Total	
		No	Area in hectares	No	Area in hectares	No	Area in hectares
1	Assam	765	232399.35	101085	105291	101850	337690.35
2	West Bengal	451	114410.47	37365	33711.27	37816	1481121.7
3	Others North India	111	11785.09	17513	38031.86	17624	49816.95
4	North India	1327	358594.91	155963	177034.13	157290	535629.04
5	Tamilnadu	133	29600.56	45765	33284.57	45898	62885.13
6	Kerala	93	30303.42	8497	5567.74	8590	35871.116
7	Karnataka	16	2171.74	0	0	16	2171.74
8	South India	242	62075.72	54262	38852.31	54504	100928.03
9	All India	1569	420670.63	210225	215886.44	211794	636557.07

Source-Tea Board o India estimates, 2018

Tea estates are distributed in view of their sizes. In earlier part of the development, the large estates are dominant till the year of 2000 . They took part in major production of tea with an area of large land holding for production of tea which is above 10.12 ha. But after the year 2000, there

is a big surge of small tea growers those who has an acreage of below 10.12 hectares in numbers. It seems that almost 98 percent of tea producers are from the small tea growers category in recent times.

Growth of the tea production is dependent on the age of the tea bush for production of green leaves. Bush of the tea gardens are assets with a production life cycle passes through different phases classified as the tender tea bushes with below 5 years has inclining production, economic tea bushes gives maximum production ranging from 5 to 50 years and old tea bushes with an age of above 50 years has a low yield. Most of the large tea estates in India are comprising of 65 percent with economic bush and 30 percent are old bush leaving only 5 percent are in the category of tender bush. As large tea estates of India are predominantly economic bush, they possess a high risk of decline in productivity adding up with the 30 percent in old bush. Rejuvenating and replanting is an important task ahead to meet the expected productive curve for most of the large estates.

Growth of tea production is significantly related to its marketing scope where the overall demand for the tea is realized with the sale of processed or made tea being settled through auction market, ex-factory or direct sale and a small part in the form of forward contract. It is found that almost 70-80 percent of tea is being sold in auction market, ex-factory sales being at 20 percent or below and forward contract is not more than 3 percent. Export market of tea has shown a trend of wide fluctuations in the last five decades and Indian tea is being exported to thirty five different

countries in the world. India being a populous country has always a high demand for its internal consumption as tea is an affordable and popular drink. The changing pattern of political, economic, social, technological factors with rapid urbanization has led the changes in tastes and preferences of tea as a drink which faces tremendous pressure from different quarters.

The growth of tea industry as a whole is not uniform or not maintaining a normal pace but it could be viewed that in 1990's tea is growing at a significantly higher rate. The large tea estate are showing a point of consolidation in producing green leaves till the year of 1990's as they faced a number of management problems and they resorted to procure its raw material or the green leaves in an outsourced mode .This is one of the reason that the small tea growers grew at a much higher rate. In this segment Tamilnadu and Assam initially followed this model while the large Tea estates had a flourishing time in 1970's and they faced a number of challenges in 1990s in terms of production, yield except the South Indian tea estates which has limited scope for further expansion. As per study of Das(2010).the falling productivity of tea gardens was due to the divergence from the recommendation of replanting of bushes at an annual rate of 2 percent. But in contrary to that most of the tea gardens followed the rate at .03 percent per annum which resulted in production fall and yearly accumulation of gaps that has led the proportion of old bush higher as compared to replanted bush which aggravated the problem and led to severe fall in production. The Indian Tea Industry and its gain can also be

assessed in global perspectives. The world tea market inherited an opportunity and because of this, countries like China, Sri Lanka and Kenya are more attracted to external markets for exports. The export of tea creates more opportunity of value addition which could be priced at higher rates by introducing variety of tea related product. The other beverages in the world market such as coffee and cocoa gains more than tea in value terms. The domestic consumption of tea at higher percentage also draws a limit which does not encourage more value additions in terms of quality and variety. India has a strong domestic market, so the Indian tea producers are not tempted for value additions which could bring more foreign exchange and growth in sustainable order.

2.2 GROWTH OF TEA INDUSTRY DURING THE FIVE YEAR PLAN

India started its planned economy with a five year plan to grow faster which encouraged entrepreneurs to come forward and contributed to the Gross Domestic Product. Tea industry could experience more enterprising authority after the introduction of five year plan. In the year of 1951 and till the year 1961 it experienced a steep rise in the internal consumption with a fall in exports. During this phase of 1951-61 the production and yield was on increasing trend. The production and percent of yield in the period of 1961-69 had grown though India faced problems across the border with China and Pakistan. Government of India devalued its currency with a rise in export duty on tea which was not favourable for

tea industry and Government finally decided to lower it. The annual growth of tea in1970-79 was on upward trend for annual yield and internal consumption. But the export of tea was increasing at 4.2 percent in 1969-74 in Fourth plan period but during the Fifth plan period from 1974-79 it came down by 1.8 percent in terms of annual growth rate .The Sixth plan period from 1980-84 had demonstrated an increase in area of plantation at 1.8 percent along with productivity, yield and internal consumption. But the most significant success came from export growth at 1.7 percent and foreign exchange earnings at 2.4 percent in terms of annual average growth. The seventh plan period (1985-90) also had shown a decline in exports and foreign exchange earnings by 0.5 percent and 10.0 percent in average annual growth rate with area wise growth rate of 5 percent, yield by 2.5 percent and internal consumption by 4.1 percent in average annual growth rate. Eighth five year plan period of 1991-96 had shown a growth in production, area wise growth, productivity growth with marginal increase in export growth. In the ninth plan period from1997-2002 the area wise tea growth was substantial with a marginal rise in production. Foreign exchange contribution has increased due to gain in unit value which was Rs 87.13 per kg as compared to Rs 85.79 at the starting year of the plan period. During the Tenth plan period 2002-2007 the area production, productivity and internal consumption was almost stagnant. It is only the domestic consumption which inclined at the average annual rate of 1.64 percent.

Table-2.2 AREA, PRODUCTION, AVERAG YIELD, EXPORT AND INTERNAL CONSUMPTION OF TEA IN INDIA DURING THE PLAN PERIOD

Particulars	Area (in000'ha)	Production (in Mkgs)	Average yield(Kg/ha)	Export(in MKgs)	Internal consumption (in M Kgs)
First Plan (1951-56)	321	309	963	233	97
Second Plan (1956-61)	331	355	1070	205	140
Third Plan (1961-66)	345	376	1089	197	184
Fourth Plan (1969-74)	362	489	1353	211	260
Fifth Plan (1974-79)	374	544	1455	200	337
Sixth Plan (1980-85)	408	620	1523	217	431
Seventh Plan (1985-90)	417	720	1729	209	500
Eighth Plan (1991-96)	433	795	1839	205	560
Ninth Plan (1997-2002)	512	826	1620	201	693
Tenth Plan (2002-2007)	522	862	1647	200	750

Source-NABARD .The Tea Industry in India:A survey

Fig-2.1
MOVEMENTS OF DIFFERENT PARAMETERS OF TEA DURING PLAN PERIODS

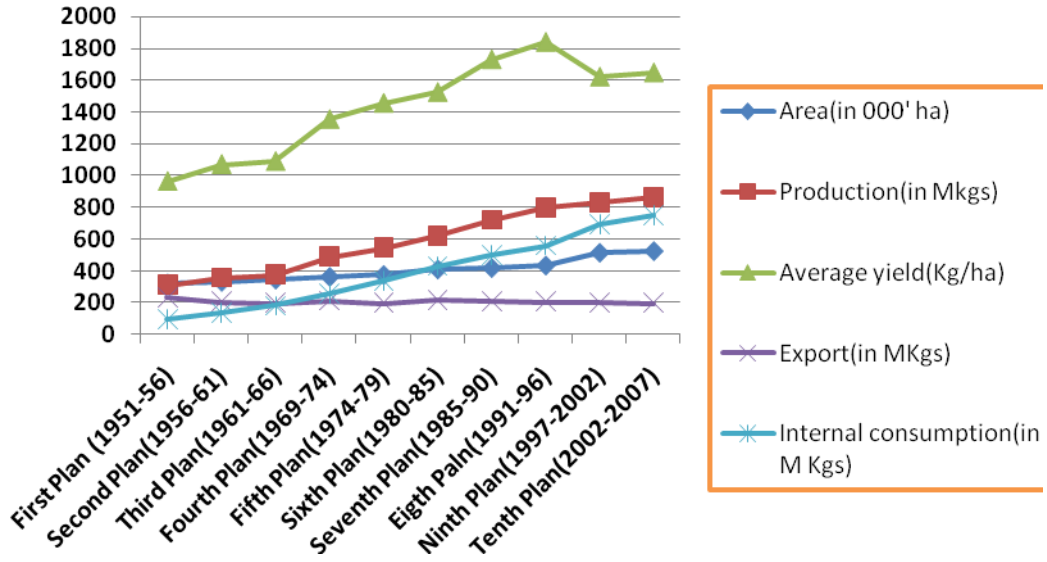


Table- 2.3 TREND ANALYSIS DURING PLAN PERIOD

Plan period	Area trend	Production trend	Avg.yield trend	Export trend	Internal Consumption trend
Second Plan(1956-61)	3.021148	14.88673	11.11111	-12.0172	30.71429
Third Plan(1961-66)	4.057971	5.915493	1.775701	-3.90244	23.91304
Fourth Plan(1969-74)	4.696133	30.05319	24.24242	7.106599	29.23077
Fifth Plan(1974-79)	3.208556	11.24744	7.538803	-5.21327	22.84866
Sixth Plan(1980-85)	8.333333	13.97059	4.67354	8.5	21.80974
Seventh Plan(1985-90)	2.158273	16.12903	13.52594	-3.68664	13.8
Eighth Plan(1991-96)	3.69515	10.41667	6.362059	-1.91388	10.71429
Ninth Plan(1997-2002)	15.42969	3.899371	-11.9086	-1.95122	19.19192
Tenth Plan(2002-2007)	1.915709	4.358354	1.666667	-0.49751	7.6

Trend analysis in area, production, average yield, export and internal consumption of Indian tea shows that the area wise in all the plan periods is showing a positive trend where ninth plan period shows remarkably higher trend in terms of acreage .The production was on a higher trend but from the eighth plan onwards ,the production trend was sliding. Although till the eighth plan the average yield was on a positive trend but from eighth period it has fall down and became negative in the ninth plan and tenth plan showing an extremely marginal increase of yield. Indian tea exports always revealed to be negative across the plan period; it is only during the fourth and sixth plan period it is showing a positive trend. Indian tea has a steady growth trend for all plan periods which is on an inclining trend.

2.3 REASONS WHICH ARE RESPONSIBLE IN DETERMINING THE GROWTH OF TEA ESTATES

Reasons which are responsible in determining the growth of tea industry especially for large estates can be traced as starting from 1950 till 2008-

I. Policy implications of Government and Geographical scenario.

II.Prevalence of Ceiling Act

III.Issues connected with Labour Act 1951

IV.Various yield and ecological issues.

2.3.1POLICY IMPLICATIONS OF GOVERNMENT AND GEOPOLITICAL SCENARIO

The development of Indian tea industry the role of private entrepreneur is pivotal which can be in terms of acreage, production and yield. As per study conducted by Karmakar (2005) and Banerjee (2005) cited in the NABARD report ,during the first five year of plan period the Plantation Inquiry Commission 1956 submitted its report to the government of India which was a landmark in the plantation of the country as it was a ground report for the tea industry which drew a good framework on importance of plantation in different organizational and geo climatic structure, capital structure review, different cost , profit and marketing possibilities along with the expansion of financial avenues and development motive was also initiated during this inquiry which paved the way for different plantations including possibilities of small growers and possibilities of export promotion. During this period, Research and Development of tea was initiated and to create central information services with a division to study Bio-Chemistry of tea, Planters Association suggested a crash programme in 1987 to grow their internal resources and Indian tea Association urged government to declare tea as a priority sector.

2.3.2. PREVALENCE OF CEILING ACT 1956

The growth of large estates of tea was highly influenced by the Ceiling Act of 1956 which ensured the fixation of land held by the tea

gardens. The land holding by the tea estate has been classified into land for expansion of plantation and land for ancillary purpose with an amendment in1971. Due to the ceiling act regime, the large tea estates who has free access to the unused land for expansion faced constrained which eventually stalled further growth of the tea estates in this segment.

2.3.3. ISSUES CONNECTED WITH PLANTATION LABOUR ACT OF 1951

Labour Act of colonial India which was effective in Assam was merely the Tea Districts Emigration Act, 1932 with a direction on employment and recruitment of labour. This kind of labour act did not take the burden of welfare programmes .The Plantation Labour Act, 1951, was comprehensive to bring the affairs of tea labourers and employees working in the tea estates. This act encompasses introduction of extensive monitoring and increased the burden of social security and welfare program. The changes of management style under the plantation Act of 1951 lowered the growth rate of tea estate production area and volume of production or the growth was in a controlled manner.

2.3.4. VARIOUS YIELD AND ECOLOGICAL ISSUES

Yield in most of the tea garden are showing a negative trend due to variety of issues which can be age of the tea bushes, labour productivity, improper management, land productivity which could be added with

delayed replantation and rejuvenation with abrupt climatic factors such as erratic rainfall and unfavourable temperature. The growth of tea estate is being restricted by ecological imbalance due to vanishing of village wood lots and other multiple crops such as sugarcane, pineapple, orange and citronella plants are also replaced.

2.4 AN ACCOUNT OF GROWTH OF TEA INDUSTRY IN ASSAM AND GOLAGHAT DISTRICT

Tea sectors in Assam was predominantly occupied by the large tea estates and growing problem of economic of scale has encouraged the tea growers to cultivate in the smallholding format with an addition to socio economic reason. At present small holding of tea is estimated to be in terms of acreage is 105291 with 320.83 million kgs of production and above 100000 in numbers absorbed as labour force till 2020. It was due to the waiver of stringent regulation of earlier days and role of institutions, small tea growers has emerged in different parts of the state (Das, 2010) in Assam.

The declining trend of large estates is due to old aged bush labour crisis and its management, absence of rejuvenation and replantation and fencing stiff competition in different market had paved the way for small tea growers for smooth entry to compensate the gap in the demand for green leaf. Replantation is recommended for the garden is 2 percent per

year but it is seen that annual replantation of large estate is taking place at 0.3 percent which has caused drop in productivity.

Higher labour cost has affected the productivity of tea growers to a large extent and ratio between the need for labourer and labour cost is not promising for the large estate to continue production. Due to this reason large estate has followed up the model of outsourcing of raw material i.e green leaves from the small tea grower the small tea growers in the manner securing the exposure to increase their productivity and eventually by grabbing the opportunity the numbers as well as production of small tea could hold the growth path. As small tea growers doesnot come under the preview of Plantation Labour Act (PLA) 1951, they are free from any burden caused by this act.

Moreover, almost all tea districts of Assam which has a distinct growth phase starting from 1991 till 2000 has some common characteristics for growth such as availability of cultivable lands, growing entrepreneurship among village youth, choosing tea cultivation as an alternative cash crops in addition to prestige associated with the local cultivation as some small growers view the cultivation of tea as a source of extra income, which is less perishable quality by nature with almost negligible storage cost, market availability and proximity of labour who has skill to take part in tea plantation.

In the year of 2020, which was suffered by COVID pandemic, the confederation of Indian small tea growers Association (CISTA) which is

the apex body for small tea growers has reported that small tea growing segment has produced 630.79 million kgs of tea which is higher than the big tea estates that produced 624.8 million kgs. However, the trend of small tea growers growth till 2019 has indicated that it could surpass the production of large tea estates production which was the result of first generation entrepreneurs strong motivation. In 2020 , during the pandemic period, the loss of production in Assam and west Bengal is over 110 million kgs due to lockdown in tea gardens and due to adverse climatic condition which was reported by Sinha (2020).

2.5 PRODUCTION LEVEL OF TEA IN ASSAM AND GOLAGHAT DISTRICT (PERIOD: 2011-2020)

In Assam, production of tea in the form of green tea or raw material by large estates is in a declining trend with more supply of raw material is being ensured by small tea growers which has a significant presence of more than 50 percent in terms of supply at present. The large estates did not maintain their plantation area in terms of rejuvenation and replanting and adding to it faced a chronic problem of labour management. Hence, from 2011 till 2020, a slow growth of production of processed tea could be identified.

The growth trend of India and Assam in terms of production of made tea which is technically calculated to be MADE TEA x4.33= GREEN TEA which can be viewed as follows :

Table- 2.4 STGs AND LARGE ESTATES PRODUCTION IN ASSAM IN MKGs(2011-2020)

Year	STG production	%age of Total	LE production	%age of Total	Total Production
s2011	148.62	23.76	476.76	76.23	625.38
2012	106.88	15.375	588.27	84.62	695.15
2013	178.98	22.15	629.05	77.84	808.03
2014	144.25	23.61	466.71	76.38	610.96
2015	139.49	26.51	386.66	73.48	526.15
2016	182.36	27.64	477.38	72.35	659.74
2017	281.92	41.90	390.91	58.09	672.83
2018	304.1	43.97	387.42	56.02	691.52
2019	320.83	47.78	350.61	52.21	671.44
2020	224.58	47.78	245.42	52.21	470

Source-Statistical Handbook of Assam.Copyright by Department of Statistics and Economics of Assam

Table- 2.5 GOLAGHAT DISTRICTs TEA PRODUCTION (IN MKGS)

Year	STG's production	LE Production	Total production
2011	15.64	26.85	42.49
2012	18.84	27.2	46.04
2013	22.11	27.67	49.78
2014	29.59	28.09	57.68
2015	24.64	28.95	53.59
2016	33.35	29.4	62.75
2017	33.61	29.96	62.57
2018	37.49	29.87	67.36
2019	43.85	30.96	74.81
2020	35.08	24.76	60.5

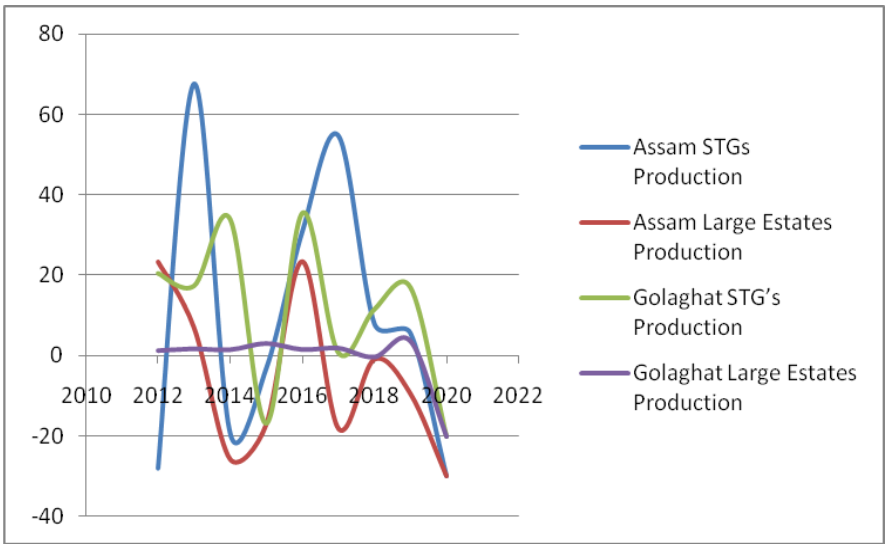
Source:Based on Tea Board of India Statistical division and AASTGA estimates

2.5.1.TREND ANALYSIS (PRODUCTION LEVEL) IN PERCENTAGE

Table-2.6PRODUCTION IN GOLAGHAT DISTRICT (IN MKGS) FOR 2011-2020

Year	Assam		Golaghat	
	STGs Production	Large Estates Production	STG's Production	Large Estates Production
2011				
2012	-28.085	23.3891	20.4604	1.3035
2013	67.4588	6.9322	17.3567	1.7279
2014	-19.404	-25.807	33.8308	1.5179
2015	-3.3	-17.152	-16.729	3.0616
2016	30.7334	23.4625	35.349	1.5544
2017	54.5953	-18.113	0.7796	1.9048
2018	7.8675	-0.893	11.5442	-0.3
2019	5.5015	-9.501	16.9645	3.6491
2020	-30	-30.002	-20	-20.026

Fig-2.2PRODUCTION TREND OF TEA IN ASSAM AND GOLAGHAT FOR STGs AND LARGE ESTATES



Production of tea

Year

The trend of STGs production in Assam is negative in from 2011 to 2012 which was due to the climatic pattern in some growing areas but positive trend is shown by STG's production in Golaghat district for the year of 2012,2013 and 2014 which was due to high yield of STG's with more entry of STGs participated in the production activity which worked as a contributing factor.In 2013,in Assam and Golaghat district,STGs had a significant contribution due to congenial climatic condition,but in 2015 both Assam and Golaghat district had a negative trend in production level.The upward trend of STGs production level could be viewed in 2016,2017,2018 and 2019for Assam with 30.73%,54.59%,7.86%and 5.50% alongwith production level trend of STGs in Golaghat district with 35.34%,0.77%,11.54% and 16.96% which was due to number of STGs entry into the market which created a high stimulus to join this

business.The year 2020 was an exceptional year due to COVID pandemic all over the world which created a negative impact that led to drop in production level as per estimates of CISTA and AASTGA.

The production level of large tea estates has demonstrated a declining trend from 2014 till 2020 in case of all over Assam .The fall in level of production is due to the high concentration of old aged bushes with low rate of rejuvenation and replantation with fall in soil fertility which is multiplied by unfavourable climatic pattern and also high dependency on green leaves supplied by green leaves. Contrary to the negative trend shown by the large estates of Assam in production of green leaves ,the large estates in Golaghat is marginally maintaining a positive trend with 1.30%, 1.72%, 1.51%, 3.06%, 1.55%, 1.90% for the year of 2012, 2013, 2014, 2015, 2016 and 2017 and a negative trend with -0.3% and -20.2% due to lesser capacity utilisation and COVID pandemic in 2020 during the year of 2018 and 2020.The large tea estates of Golaghat district is also trying to maintain an optimality in tea leaves collection from STGs in the vicinity and growing tea leaves on their own.Moreover,STGs in the Golaghat district is highly inclined towards Bought leaf tea factories for tea leaves supply and due to this reason a sizeable number of BLFs are also growing in the region. As Bought Leaf Tea factories do not take part in tea cultivation, they have a strong tie up with STGs for green leaves production.

Table-2.7GROWTH RATES OF PRODUCTION LEVEL

Item	Assam		Golaghat	
	STGs Production	Large Estates Production	STGs Production	Large Estates Production
CAGR	10.4	-7.2	12.6	10.8

The CAGR of tea production in Assam for STGs and large estates for 2011-2020 is calculated to be 10.4 %and -7.2%.The CAGR calculated for STGs production in Golaghat district is 12.6% and large estates in Golaghat district has CAGR of 10.8%.In both the cases for Assam and in Golaghat district the STGs has a higher growth rate than the large tea estates.In Assam,the difference in STGs and large estates CAGR for production level is extremely high for the period of 2011-2020 which can be one of the reason identified as strategic trade-off in between STGs and large estates in production of green leaves.

Table-2.8 DESCRIPTIVES OF STGs PRODUCTION LEVEL

Item	Assam		Golaghat	
	STGs Production	Large Estates Production	STGs Production	LargeEstates Production
Mean	203.20	439.92	29.42	28.37
SD	75.67	113.06	8.93	1.83

The standard deviation (SD) calculated for the year 2011-2020 has shown that overall production level of both STGs and large estates in Assam has higher SD of 75.67 and 113.06 as compared to the production level of STGs and large estates in Golaghat as 8.93 and 1.83.

Table-2.9 OTHER RESULTSON PRODUCTION LEVEL

Items	R
STGs Production and Large Estates production n Assam	**-.567**
STGs Production and Large estates production in Golaghat	**.513**

The Correlation calculated in terms of Pearson's R for 2011-2020 shows that STGs production and large estates production in Assam shows a significant but negative score of -0.567 while STG's production and large estates production for 2011-202 has a significantly higher 'R" value of 0.513.

2.6 PRODUCTIVITY OR YIELD OF TEA

Table- 2.10 PRODUCTIVITY OF TEA IN ASSAM AND GOLAGHAT

Year	Large estates(Assam)	STGs(Assam)	STGs (Golaghat)
2011	2080	1676	NA
2012	2518	1205	NA
2013	2693	2018	2953
2014	2007	2007	3230
2015	1662	1662	2550
2016	2051	2331	3440
2017	1645	3448	2742
2018	1667	2888	3059
2019	1504	3025	3154
2020	1051*	2078*	2207*

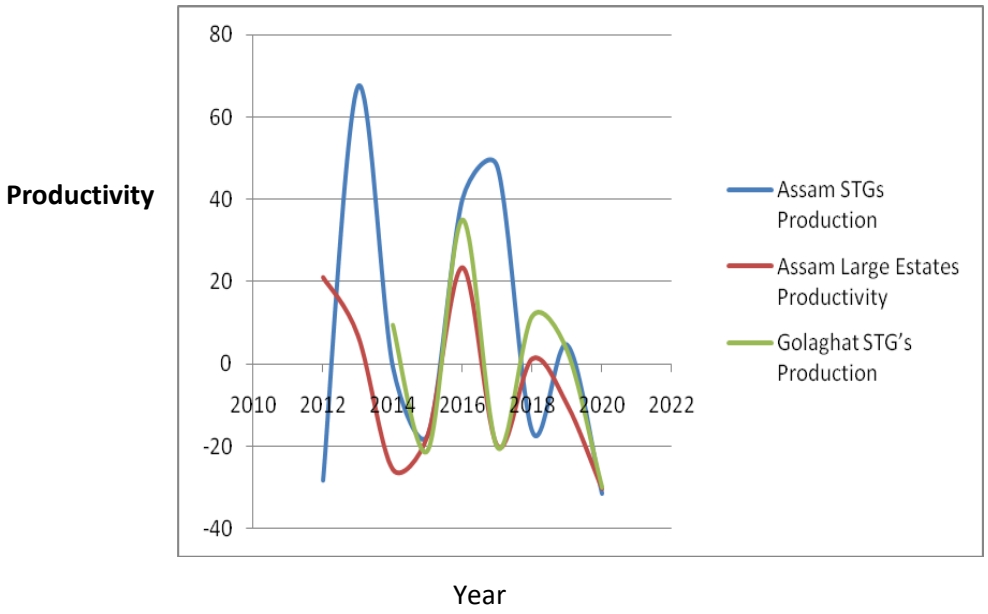
Source-*Estimated as per CISTA and Tea Board of India
Statistical Handbook of Assam.Copyright by Department of Statistics and Economics of Assam.

The productivity of tea or yield is effected by composition of factors which could be labour productivity, climatic condition , decision of stakeholders on procurement and price set by large estate factories, bought leaf tea factories role, fluctuations in auction market price, effect on soil.Fertility due to application of pesticide and herbicides, practice of non recommended treatment of land. Indian tea industry landscape is going through ups and downs for last decade in terms of productivity. Mech (2018) has identified that with the progression of time the variation in yield or productivity of tea is highly significant.

Table-2.11PERCENTAGE TREND ANALYSIS FOR PRODUCTIVITY IN ASSAM AND GOLAGHAT

Year	Assam		Golaghat
	STGs Production	Large Estates Productivity	STGs Production
2011			
2012	-28.103	21.0577	
2013	67.4689	6.95	
2014	-0.545	-25.473	9.3803
2015	-17.19	-17.19	-21.053
2016	40.2527	23.4055	34.902
2017	47.9193	-19.795	-20.291
2018	-16.241	1.3374	11.5609
2019	4.7438	-9.778	3.1056
2020*	-31.306	-30.12	-30.025

Fig-2.3
PRODUCTIVITY TREND OF STGs AND LEs OF ASSAM(2011-2020)



The productivity trend analysis for small tea growers, large tea estates of Assam is being considered alongwith STGs production of Golaghat for the year 2011-2020.The STGs productivity for Assam has fluctuating movement which may be due to its unorganized nature with entry of new STGs at different point of time with odd behaviour of climate which creates fluctuations. In 2012,it has a negative trend with -28.10 % which again increased to 67.64% due to suitable climate with higher flush of green leaves.However, the year 2014 and 2015 has a negative trend with -0.54% and -17.9% .Again a positive trend is being viewed with 40.25% and 47.91% for the year 2016 and 2017.A fluctuating trend could be seen with -16.24% in the year 2018 and 4.74 % in the year 2019.However ,due to COVID pandemic in 2020,the negative trend with almost 30% productivity loss is estimated .

STGs productivity for Golaghat for the years of 2014,2015,2016,2018,2019 also follows a similar trend with 9.3, -21.05%, 34.90%, -20.29%,11.56%3.10% and -30.2% which may be due to constant entry of number of STGs with new plantations with age of around 5 years or tending for maturity that can give better yield.

Table- 2.12 GROWTH TRENDS OF PRODUCTIVITY OF STGs AND LEs (2011-2019)

Items	Productivity of Large Estates of Assam	Productivity of STGs of Assam	Productivity of STGs of Golaghat
CAGR	**-7.3**	**7.6**	**0.6***

Calculated for 2011-2019

The productivity growth rates for the year 2011-2020 is calculated for large estates of Assam and STG's of Assam in CAGR is -7.3% and 7.6%.The productivity for STGs in Golaghat in CAGR is 0.6%.

Table-2.13 OTHER DESCRIPTIVES ON PRODUCTIVITY

Items	Productivity of Large Estates of Assam	Productivity of STGs of Assam	Productivity of STGs of Golaghat
Mean	1887	2233	2980
SD	486	695	299

The Standard deviation (SD)for the year 2011-20 shows higher SD for productivity of large estates of Assam.Standard deviation for productivity of STGs of Assam is 486 for large estates of Assam and 695 for productivity of STGs of Assam as compared to the productivity of STGs of Golaghat is 299.

Table- 2.14 CORRELATION RESULTS ON PRODUCTIVITY

Items	R
STGs Productivity and large estates productivity in Assam	-0.567
STGS Productivity and large estates productivity in Assam	0.513

The Correlation R for STG's productivity and large estates productivity in Assam is -0.567.However,STG's productivity and large estates productivity in Golaghat is 0.513.

2.7. GROWTH OF EXPORT AND INTERNAL CONSUMPTION IN INDIA

Dhakre (2015) has mentioned in his study on Indian export of tea where the correlation between the export and production of tea till 2013 for the last four decades is not strong which indicates that Indian export is not growing significantly as compared to annual production . Navitha (2018) and Sethuraman (2018) in their studies have identified that the South Indian region is concentrating more on export of tea than North Indian tea. The North Indian tea production with their huge acreage and volume is more of domestic market centric and they are plagued by slow increase in yield and almost stagnant in terms of expansion in plantation area. Sivakumar (2016) has stated that the problem with slow growth of Indian export is increasing its share in world tea exports as compared to other tea producing countries. Higher domestic consumption, compromise in Indian tea quality with high growth of small tea growers and availability of tea at lower prices.

Pajankar (2009) and Thakare (2009) have stated that almost a quarter of tea produced is consumed within the country but for more

expansion of Indian tea, export of tea should be promoted with more quality consciousness and value additions. In a recent study conducted by Rakshit (2019) revealed in the "Business Standard" newspaper that consumption of tea has shown a downward growth by 2.4 percent in 2018 as compared to 2017 ,as the quality options in Indian tea variant is very much limited as compared to other beverages which offer variety of choices. Ghosal (2020) in the "The Economic Times "has marked that the global pandemic which caused prolonged shutdown has affected the outdoor consumption of tea which is mostly consumed at roadside tea stalls, restaurants, offices and other working places marked the fall in the Indian Tea consumption by 25-30 percent. All Indian Tea Traders Association of (AITTA) has identified that out of home consumption of tea is almost 40 percent of domestic sales of beverages.

Table-2.15 INDIAN TEA EXPORTS AND INTERNAL CONSUMPTION IN M KGS

Year	Indian export	Internal consumption	World Exports
2011	215.43	921	1653.06
2012	208.26	942	1544.7
2013	219	1002	1683.0
2014	207	1019	1674.8
2015	228.66	1018	1776
2016	222	1044	1863
2017	252	1059	1760
2018	252.01	1084	1803
2019	252.15	1090	1796
2020	207.58	1116	

Source-Based on Tea Board of India Reports. Copyright by Tea Board of India

Table- 2.16 GROWTH RESULTS OF EXPORTS AND INTERNALCONSUMPTION OF TEA(2011-2020)

Item	Export of Indian Tea	Internal Consumption of Indian Tea
CAGR	10.4	10.2

The growth result shows the export of Indian tea for 2010-2020 is 10.4 in CAGR and internal consumption is 10.2 in CAGR.

Table- 2.17 CORRELATION RESULTS ON GROWTH IN BETWEEN EXPORT,INTERNAL CONSUMPTION WITH STGs PRODUCTION

Pearson's "R" between Export and tea production of STGs in Assam	.840
Pearson's "R" between internal consumption and production of STGs in Assam	.767

The correlation 'R' between export of Indian tea and tea production of STGs in Assam is .840 and R between internal consumption and production of STGs in Assam is.767.

2.8 ACREAGE GROWTH OF TEA GARDENS IN ASSAM

Table- 2.18 PERCENTAGE ACREAGE OF TEA GARDENS (in ha)

Year	Large estates in Assam	Trend	STGs in Assam	Trend	STGs in Golaghat district	Trend
2011	229140		88674		2510	
2012		1.91	88674	0	2715	8.167331
2013	233536	0	88674	0	7185	164.6409
2014	232529	-0.43	71871	-18.9492	9160	27.48782
2015	232529	0	83880	16.7091	9661	5.469432
2016	232670	0.06	78203	-6.768	9693	0.331229
2017	232670	0	82119	5.007481	11288	16.45517
2018	232399	-0.11	105291	28.21759	11288	0
2019	NA	NA	NA	NA	13900	23.13
2020	NA	NA	NA	0	NA	NA

source-Tea Board of India Statistical Division estimates

The trend analysis of acreage for the year of 2011-2020in case of large estates of Assam, STGs in Assam and STGs in Golaghat shows that large estates in Assam has marginal growth or no growth for the year of 2012, 2013, 2014, 2015, 2016, 2017 and 2018 with percentage trend being 1.91%, 0%, -0.43%, 0%, 0.06%, 0%, -0.11%.However,STGs in Assam has positive growth trend of 16.7%,5%,28.21% in 2015,2017,2018 with a negative trend of -18.94% in 2017.STGs acreage in Golaghat has an unique trend with positive growth of 8.16%, 164.64%, 27.48%, 5.46%, 0.33%, 16.45%, 23.13% for the year of 2012,2013,2014,2015,2016,2017 and 2019.

Table- 2.19 GROWTH RESULTS OF ACREAGE IN ASSAM AND GOLAGHAT

Item	Large estates of Assam	STGs in Assam	STGs in Golaghat District
CAGR	0.1	0.7	22.3

The CAGR in terms of acreage for large estates of Assam. STGs in Assam and STGs in Golaghat district for the period of 2011-20 is 0.1, 0.7 and 22.3.

Table-2.20 CORRELATION RESULTS ON ACREAGE BETWEEN LEs AND STGs

Item	Between large estates and STG's of Assam	Between STG's of Assam and Golaghat
Pearson's R	-.146	-.056

The Correlation for acreage in terms of Pearson's R for large estates and STG's of Assam is -.146 and Correlation between STG's of Assam and Golaghat is -0.056

2.9. SMALL TEA GROWERS AND DEVELOPMENT SCENARIO

A summarized view on development in state and in Golaghat district region due to the emergence of small tea growers can be assessed on the basis of contribution towards state economy. The state of Assam is dependent on its primary sector or agricultural sector which has an overall 75 percent contribution towards state's economy. The total cultivable land available in Assam is identified to be approximately 38 percent of total geographical area of the state. The tea industry has over 50 percent share in the overall production of the country and it plays a pivotal role in the economy. It is due to the reason that various institutions are connected to the orbit of tea industry.

In Assam, every year, it is being emphasized to improve its secondary and tertiary industry but no significant gain could be achieved. The tea industry in Assam is always contributing steadily to its GDP account whether it is from large estate or contribution made by the STGs. During the 1990's the state suffered a huge crisis of unemployment and it was the tea industry in the format of STGs led the change of economic development. The tea growing district of Upper Assam ,Lower Assam and Barak Valley has significantly better economic development indicators in terms of per capita income , health care, nutritional intake, better roadways and communication system, consumer behaviour with better market access for tea, drinking water quality, housing and moreover better entrepreneurial

direction due to small tea growing practice. However, Bora(2008) in his study has marked the economic transition in Golaghat district is due to the STGs contribution towards inclusion of new group of people in tea producing segment which also includes poor cultivators who takes part in producing and marketing in a competitive scale, development of rural areas with proper utilization of land, additions to the states tea industry as well as country's tea industry with creation of employment in the supply chain which increases demand for input and other items.

Table- 2.21 NO OF SMALL TEA GROWERS IN GOLAGHAT DISTRICT –YEARWISE

YEAR	NO.OF GROWERS	PERCENTAGE TREND
2011		
2012	1387	
2013	10286*	86.51565
2014	10286*	0
2015	10341	0.531863
2016	10596	2.406569
2017	12254	13.53028
2018	12254	0
2019	13106	6.500839
TOTAL		

Source-Statistical handbook of Assam

***AASTGA estimates**

The employment seeking people is getting engaged with the advent of STGs in Golaghat district of Assam which can be traced as those who are working as labour, vehicle owner connected with transportation of leaves, collection agents, bought leaf factory employees. The operating cycle of STGs which lasts for almost eight months in a year provides

income to different stakeholders. The STGs create opportunities for surplus labour of large estates for variety of works such as pruning, plucking, drainage and maintenance, spraying fertilizers, weedicides, pesticides and nutrients. According to Hannan (2017), in tea growing states of North India, it is almost 1.3 million people who are related to the tea subsector for livelihood. In Golaghat district, the STGs are showing promise in terms of assured regular income, better cash flow, provision of social security, improvement in purchasing power which can be supplemented with usage of information technology for better quality of life.

2.9.1. STGs AND MARKET EXPANSION

STGs have contributed to the expansion of market in the tea industry. The STGs entry has ensured an overall growth of the tea production which has finally resulted in the rise in overall supply of make tea. In 1990's, when STGs production escalated, it provided positive signal for the establishment of Bought Leaf Factories or standalone factories which was highly dependent on the STG's green leaf supply. The number of Tea Board of India licensed Bought Leaf Tea Factories is thirty six (36) in Golaghat district. The TMCO (Tea Marketing and Control) Act, 2003 estimates that all the bought leaf factories under operation in Golaghat district are processing tea as per assigned capacity and growth of BLFs which also signifies a parallel growth of STGs in the region.

Table- 2.22PROCESSING UNITS CAPACITY OF TEA IN GOLAGHAT

Sl.no	No. of Factories	Total Capacity (Processed Tea) in Kgs	Percentage of Total Capacity	Total Capacity for green leaves In Kgs
1	No. of large estate factories 49	36260000	58.44	157438800
2	No. of Bought Leaf Factories 36	25850000	51.55	111930500
Total	85	62210000	100	269369300

Source-Tea Board of India –Regional Office

It is seen that, the BLFs capacity in Golaghat has a total capacity of 25850000 kgs which is 51.55 percent of total capacity till the year of 2020. The large tea estates factories are having a total capacity of 36260000 Kgs which is at 58.44 percent of total processing capacity in Golaghat district. Moreover, the tea outturn rate is being calculated that green leaves= 4.33 × made tea which means that if total capacity of BLFs processing unit is multiplied by 4.33, the total demand for green leaves which can be demanded by BLFs alone is 111930500 Kgs per year.

2.9.2 SMALL TEA GROWERS LINKAGE WITH RELATED INDUSTRIES

The state of Assam in India is rich in natural resources but the pace of industrial growth in the state is not impressive. Tea plantation has a unique place in contributing towards the gross domestic product of the state. Tea is grown in India as it is a long lasting crop with regular return. Maintenance of tea gardens always has a special role for its

survival and profitability by gaining a desired yield. Small tea growers are having a growth for the period of 2008-2018 in Golaghat district and consequently acreage of tea plantation is rising due to more entry of STGs. It is also viewed that in Golaghat district of Assam, almost 80 percent of the small tea gardens has attained maturity stage and started producing green leaves as an usual phenomenon .It could be viewed that due to decay in soil fertility with heavy exploitation of soil, the use of fertilizer is pertinent along with application of weedicides and nutrients to maintain yield. It is also estimated that the crop life cycle of tea is around 50 to 80 years but the most important part of it is the maintenance through application of required ingredients. With the growth of STGs the fertilizer with Nitrogenon (N), Phosphatic (P_2O_5), Zinc(Z) and Potassic(K_2O) is getting boosted along with weedicides.

Table- 2.23 YEARLY REQUIREMENT OF INPUTS(Kg/ha)

Age of Bush (in years)	Urea Kg/ha per year	Single Super Phosphate Kg/ha per year	Murate of Potash Kg/ha per year	Nutritional Supplements Kg/ha per year	Total consumption (Fertilizer+Nutrient) Kg/ha,per year(growth based)	Method
0	45-90	60-120	30-67	37-82	172-360	Cycle for each plant for 2-3 times @5-6 gms
>1 year	172-218	247-262	135-165	172-187	727-832	Cycle for each plant for 4 times @10-15gms
>2 years	218-262	262-285	165-202	187-225	832-975	Cycle for each plant for 4 times @15-20gms
>3 years	262-300	285-367	202-232	225-270	975-1170	Cycle for each plant for 4 times @20-25 gms
>4 years	300-322	367-495	232-247	270-315	1170-1380	Spray it into 1:1 quantity for two times in between lines
>5years	300-322	367-495	232-247	270-315	1170-1380	Spray it into 1:1 quantity for two times in between lines

Name of Fertilizer	Source	%age of total Production
Urea	Nitrogen	46%
Single super Phosphate	Phosphate	16%
Rock Phosphate	Phosphate	22-24%
Murate of Potash	Potassium	60%
DiAmonium Phosphate	Nitrogen	18%
	Phosphate	46%
Zinc Sulphate	Zinc /sulphar	23-35%/11-18%
Boric Acid	Boron	17%
Sulphax	Sulphar	80%

Source-Manual of Mission Assam Qualitea, An initiative of Assam Govt. and Tea Research Association Tocklai, 2018

Table-2.24 ESTIMATED TOTAL DEMAND OF INPUTS FOR STGs IN GOLAGHAT, AGE OF PLANTATION>5 YEARS OLD(ESTIMATION MADE FOR 2020)

Total Acreage of STGs in Golaghat (in ha)	Items	Total demand per year (estimated in Kgs)
13900	Urea	417000
	Single super phosphate	5101300
	Murate of Potash	3224800
	Nutritional supplements	3753000
	Total consumption(Fertilizer+Nutrient)	16263000

The fertilizers quantity for tea growers is presumably high which can be Nitrogenous fertilizers like urea which is crucial for growth of tea leaves. Apart from nitrogenous fertilizers, a widespread use of Phosphatic and Potassium, Zinc, Sulphur and Boron is required in a recommended quantity. The recommended quantity of fertilizer has been suggested by the Tea Research Association at Tocklai and chemical fertilizers industry. The application of weedicides and pesticides are on an inclining trend due to growth of small tea growers in Golaghat district. It is also seen that with ageing number of tea bushes needs higher quantity of manuring for restoration of its productive capacity.

It is drawn that for the initial year of planting, the requirement of manures such as urea, single super phosphate, Murate of potash and nutritional supplement is low as compared to the year of maturity which is normally at the fifth year from planting. The quantity of inputs required for

total consumption in the fifth year will be 5 to 7 times to the quantity which is required in the first year.

2.10 REASON FOR GROWTH OF STGs IN GOLAGHAT DISTRICT

The reason for emergence of small tea growers in Golaghat district is ranging from political, economic, social, technological and legal factors. During the 1990's, the state of Assam had a turbulent time in politics and people had no option for employment either in government sector or in privately owned enterprises. The political unrest also created economic impediment for the public to make a judgment on livelihood. The cultivation of tea was an inherited culture for most of the districts in the upper Assam and large tea estates in the tea gardens had a role in sharing the technological knowledge of tea growing. Moreover, the legal obligations due to plantation and labour sets alongwith land acts created apathy for the large estates for expansion. The various reasons for growth of small tea growers in Golaghat district can be summarized.

I.DECISION UNDERTAKEN BY THE JANATA DAL GOVERNMENT OF ASSAM

The role played by the Janata Dal Government of Assam in 1978 was instrumental in encouraging the people to grow tea in small holdings. The agriculture minister at that time, Late Soneswar Bora was a member of

legislature assembly of Golaghat pioneered to bring the concept of small growers which was a sharp drift from the colonial format of growing tea in large estates. Because of this reason, the small tea growing under acreage of 10.12 ha become prominent and influences the life of the people by motivating them to grow green leaves.

II.ATTRACTIVE AMONG EDUCATED YOUTH

During the period of 1990's, the opportunity in government sector was limited and due this a number of educated youth had no option of employment. Apart from this growing tea in the tea district was regarded to be a respectable profession. It lured the educated youth to adopt this method of growing tea in small holdings with limited resources in available cultivated lands.

III.PROXIMITY OF ESTATES FACTORIES

The existence of large tea estate factories in the Golaghat districts was a link for the growing number of small tea gardens to the ultimate market. The decision taken by the estates factories to procure green leaves was a morale booster for the new small tea growers to expand their size of cultivation as well as volume of production. Consequently, the number of registered tea factories is 91 for BLFs and large estates together in Golaghat district.

IV. GROWTH OF BOUGHT LEAF TEA FACTORIES (BLTFS)

Bought Leaf Tea Factories or concept of standalone factories without cultivation of tea has a strong role in the growth of small tea grower in Golaghat district of Assam. BLFs provided the necessary pull for the small tea growers to develop an upstream market as a potential alternative to estate factories the existence of BLFs was solely dependent on STGs which created synergy for both segments.

V.AVAILABILITY OF WITH FAVOURABLE UPLANDS

The Golaghat district was a part of the tea growing belt of upper Assam with abundant uplands necessary for growing tea which has suitable fertility with presence of soil nutrients with desired rainfalls. This factor has contributed at large for the new generation growers to adopt this plantation.

VI.LABOUR FROM NEARBY SOURCE

The large tea estate has a sizeable number of temporary workers that are required for shifts or on rotation basis. This type of hired labour, created a necessary labour pool for the growing tea growers which contributed reasonably to the small tea grower's growth by delivering their skill and knowledge of cultivation.

VII.EXISTENCE OF TEA GROWING CULTURE

The district of Golaghat being a part of the tea growing districts already had an exposure to the tea gardens or has a cultural binding with tea. During the Britishers time, a number of people were employed in the tea gardens in various capacities from managerial, clerical to supervisory capacity. It is due to this, the tea culture provided the necessary ingredients involvement with their type of tea growing.

VIII.GROWING NUCLEAR FAMILY WITH A NEED FOR ADDITIONAL SOURCE OF INCOME

The socio economic impact of growing nuclear family is immense. The families which had a single source of income due to joint family system had to diversify them self for increasing the need of new form of livelihood. It is a result, it has become imperative for the newly grown family under the new system to explore new form of livelihood. In the agrarian society of Assam, the paddy cultivation was the principle one followed by household members either having income from government sector jobs or cash crops such as pineapple, sugarcane and other form vegetables. But in Golaghat district, sugarcane lost its importance after the closure of sugar mills and division of land under the new family structure compelled the people to accept a better form of cultivation such as tea in small holdings.

IX.ADOPTION OF MODEL OF OUTSOURCING OF GREEN LEAVES BY LARGE ESTATES

Decision of outsourcing of green leaves by large estates was a breakthrough which impacted the growth of the small tea growers. The large estates in the Golaghat districts was suffering from low productivity due to old age bushes with burgeoning load of maintenance such as rejuvenation, replanting and Labour Plantation Acts.

Moreover, the supervisory burden was lesser if they rely on outsourced green leaves by the STGs could access a ready market which has streamlined their supply and ultimately provided all necessary inputs to grow.

CHAPTER-III

INSTITUTIONAL ROLE FOR THE SMALL TEA GROWERS

3.1 INTRODUCTION

Institutional role is deeply related to the development of any plantation landscape. Small tea growers have a strong relation with the socio-economic factors which has fuelled growth. The performance of small tea growers needs to be sufficiently inclined towards its sustainability alongwith the factors which influences its growth and development. Institutional role should bring prosperity by promoting self-reliance among the small tea growers which should be rooted to the existing system. The stakeholder's role in case of local level implementation of programs designed for STGs is immense whether it is a political or a technical role. The institutional role can be easily noticed by looking into the expansion in number of STGs along with organic growth of individual entity. The institutional role should also envision the entrepreneurial activity in STGs and enhance their cartel arrangement to raise their issues in an appropriate platform. It should also create an environment to attract more investment opportunities which could be vital for expansion. The role should be helpful in building up marketing infrastructure with development of human resource to mobilize financial resources in the form of credit and capital. It should create community based ventures to manage their existing resources

that can stimulate growth. Apart from program implementation by administrative structure of government agencies, the financial inclusion, market accessibility and effective information system with training and development by research and technical institutions for knowledge sharing is important for overall performance.

3.2 A BRIEF SUMMARY ON BACKGROUND OF INSITIUTIONS

Various institutions are connected with the small tea growing business and they have an extensive role to play in different capacities whereas main activities of the institutions can drawn to be administrative services, inclusion of STGs in financial ambit, marketing activity and imparting training and knowledge sharing. However, the scope of their role is even larger.

Administrative structure of the institutions whether it is regulatory or developmental includes organizations like Tea Board of India and Small Tea Growers Directorate .Apart from administrative role ,Tea Board of India also takes charge of financial inclusion for the STGs by formulating schemes. In marketing decision process with fixation of price, bought leaf factories has dominant role and institutions like All Assam Small Tea Growers Association (AASTGA),North East Tea Association (NETA) and Self help groups play the role as a collective platform to place the need of the STGs in the right platform. The Tocklai Tea Research Association is actively imparting in knowledge dissemination and information sharing.

Although quality assessors like trust tea do not have a direct role for STGs ,but their guidelines for compliance is vital to maintain the demand for the STGs product with a substantial gain.

3.3 TEA BOARD OF INDIAS INITIATIVES

The Tea Board of India was established under section 4 of the Tea Act, 1953 which was finally constituted on April 1, 1954. Tea Board is headed by a chairman and 30 members are appointed by the government of India from varied background. Tea Board of India was first suggested by the plantation enquiry commission with a framework under which it can operate.

3.3.1 AN ASSESMENT ON THE ROLE OF TEA BOARD OF INDIA

The Board of India mainly has function with a direction to develop the tea gardens, undertake initiatives for research and promotion which is by and large delivered through its administrative capacity. The small tea growers are also included into their programmes for its rapid growth and development.

3.3.2DEVELOPMENT ACTIVITIES FOR TEA GARDENS

Tea gardens performance is highly linked to the expansion through new plantation, replantation and rejuvenation that is vital for physical

achievement. Tea Board is rendering its functions through financial and technical assistance to the cultivators along with marketing and manufacturing activities.

Tea Board of India formulates a budget keeping two sections for plan expenditure and non plan expenditures. The cost of administrative is being managed with a tea cess of Rs.50 paisa per Kg under section 25 (1) of the tea act of 1953. The activities which are oriented with the field development to increase field productivity and reduce cost of production. Productivity of tea is associated with the rejuvenation and replantation, pruning efficiency and expansion towards the hill areas with drainage and irrigation facility has been given priority. During the period of 2009-2010, financial assistance at 50 percent for replantation was introduced for replacement. 25 percent subsidy was provided and 25 percent subsidy was granted on actual cost for irrigation, drainage and transportation with a ceiling limit of 10,000 per hectare.

3.3.3 OTHER INITIATIVES OF TEA BOAD OF INDIA

Tea Board of India works for quality upgradation and product diversification (QUPD) and maintains a special purpose fund from 2007-2008 for uprooting in large size and replantation of old bushes, ensure smooth banking and inspection .Tea Research initiatives are extended through financial support of 80 percent meant for total cost of research. It is being provided under two different categories such as grant-in aid in 49

percent and 31 percent comes under additional excise duty(AED).Tea Board of India undertakes various promotional activities in international markets in the line of quality control guidelines of ISO 3720 standards and HACCP(Hazard Analysis and Critical Control Points).The consumption pattern of tea is also maintained by TBI either in domestic or foreign markets.A strategy is followed in this regard to comply with WTO regulations.

3.3.4 SMALL TEA GROWERS DEVELOPMENT

Small tea growers are considered as a potential segment for countries tea production landscape. The growth of STGs is impressive and the production curve of the tea is being controlled by the supply side of green leaves output of STGs. Tea Board of India had set up a small tea growers directorate in Dibrugarh in 2013 to observe the development of the STGs with two sub-regional offices (SRO) in major tea growing area. Tea Board of India has identified the STGs in the tea growing region by providing identity card with QR Code to ensure better transparency in the supply chain system by integrating stakeholders such as small tea growers, factories (EF+BLF), green leaf agents, self help group and board's official. It is observed that small tea growers have been covered under PDS (Promotion and Development scheme) activities from the year of 2012-13 and program has been set to encourage replanting, rejuvenation. The

overall physical and financial achievement which has been targeted for STGs can be assessed as below-

Table-3.1PHYSICAL AND FINANCIAL ACHIEVEMENTS OF SMALL TEA GROWERS

YEAR	ACTIVITIES	PHYSICAL(ha)	FINANCIALS (in Crores)
2012-13	Replantation	95.66	0.75
	Rejuvenation	412.59	1.0602
	Self Help Groups(in numbers)	27	4
	New Plantation	1056.62	5.83
2013-14	Replantation	27.94	0.3078
	Rejuvenation	379.68	1.03
	Self Help Groups(in numbers)	74	2.47
	New Plantation	758.59	6.14
2014-15	Replantation	21.9	0.22
	Rejuvenation	325.04	0.93
	Self Help Groups(in numbers)	87	2.82
	New Plantation	1002.56	8.8
2015-16	Replantation	9.11	0.72
	Rejuvenation	330.01	1.27
	Self Help Groups(in numbers)	26	0.98
	New Plantation	63.7	0.73
2016-17	Replantation	1.62	0.073
	Rejuvenation	264.83	1.39
	Self Help Groups(in numbers)	28	1.72
	New Plantation	192.18	1.63
2017-18**	Replantation	8.97	0.906
	Rejuvenation	479.58	1.71
	Self Help Groups(in numbers)	33	1.73
	New Plantation	189.18	1.99
2018-19**	Replantation	3.62	0.03
	Rejuvenation	78	0.28
	Self Help Groups(in numbers)	303	0.28
	New Plantation	170.39	2.35
2019-20**	Replantation	52.23	0.18
	Rejuvenation	2887.66	3.17
	Self Help Groups(Nos)	85	0.12
	New Plantation	349.5	6.04
	Total		

Source-***Tea Board of India Reports***

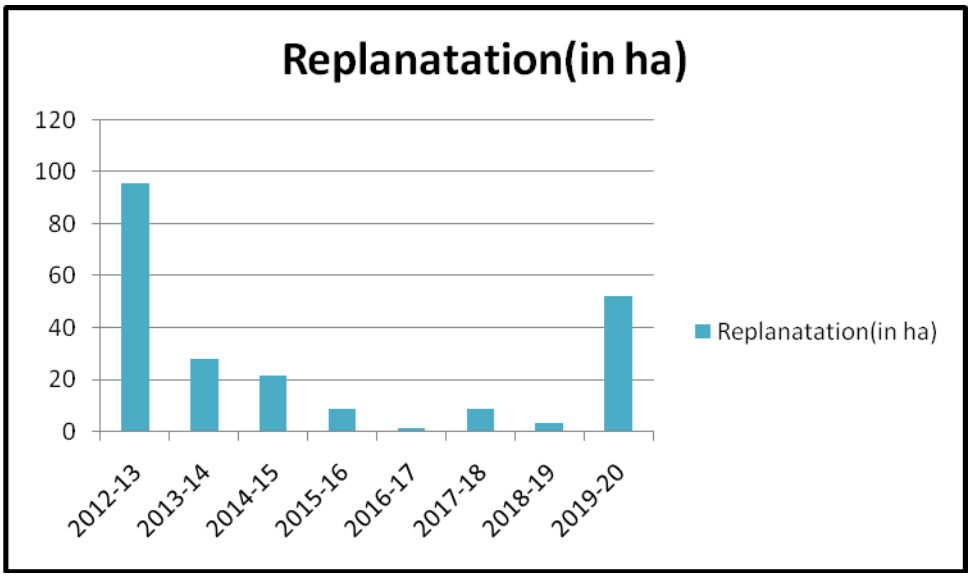
*PDS***Both PDS and SGPDS-Tea Development and promotion schemeSGD-Small Growers Development Scheme*

3.3.5 ANALYSIS OF FUND ALLOCATION BY TEA BOARD OF INDIA FOR TEA GROWERS

Tea Board of India usually allocates funds for tea growers under Tea Development and Promotion scheme (PDS) and Small Growers Development Scheme(SGD)which are being spent for activities like replantation, rejuvenation ,new plantation and self-help groups promotion. The magnitude of allocated funds can be analyzed in terms of area in hectares and amount spent in rupees. It is viewed that Tea Board of India is actively allocating funds for the activities for 2012-2019.It is not possible for tea planters to uproot the whole tea plantations which may cause huge revenue loss .In this situation to maintain a better yield replanting of tea is undertaken to manage the revenue earnings by partial plantation of tea bushes. Rejuvenation of tea plants is normally implemented by skiffing or pruning of tea with adequate agronomical measure .

Fig-3.1

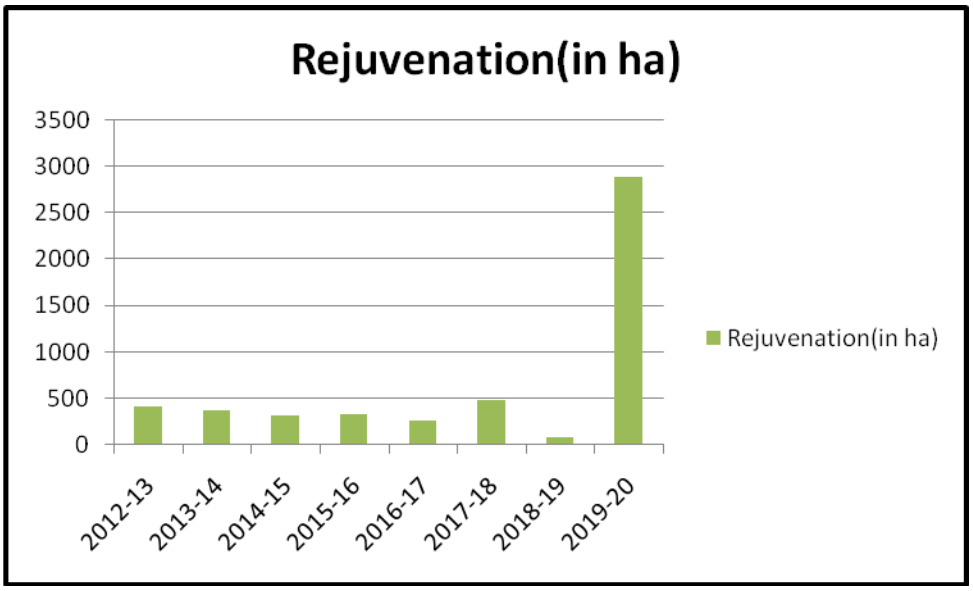
TBIs COVERAGE OF REPLANTATION OF TEA(in ha)



It is viewed that replantation was undertaken in a higher quantity in the year of 2012-13covering an area of 95.66 ha which came down to 27.94ha in 2013-14,21.9 ha in 2014-15,9.11 ha in 2015-16,8.97 ha in 2016-17,3.67 ha in 2017-18.But a significant rise can be seen in the year of 2019-20due to allocation made by both Tea Development and Promotion Scheme(PDS) and Small growers Development scheme(SGD).

Fig-3.2

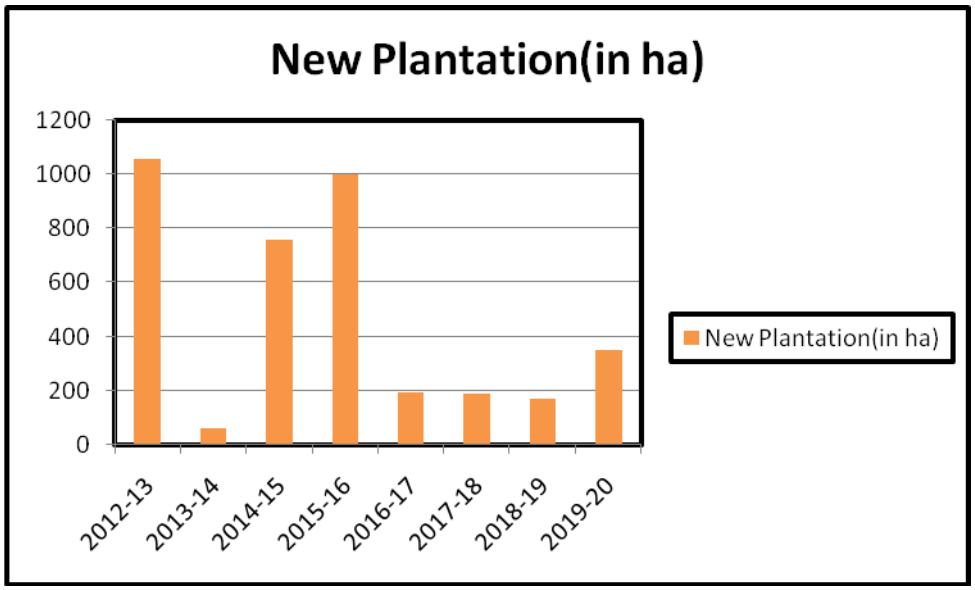
TBIs COVERAGE OF REJUVENATION (in ha)



In the same manner, rejuvenation was undertaken with 412.59 ha in 2012-13,379.68 ha in 2013-14,324.04 ha in 2014-15,330.01 ha in 2015-16,263.83 ha in 2016-17,479.58 ha in 2017-18,78 ha in 2018-19 and a massive allocation took place in 2019-20 for an area of 2887.66.

Fig-3.3

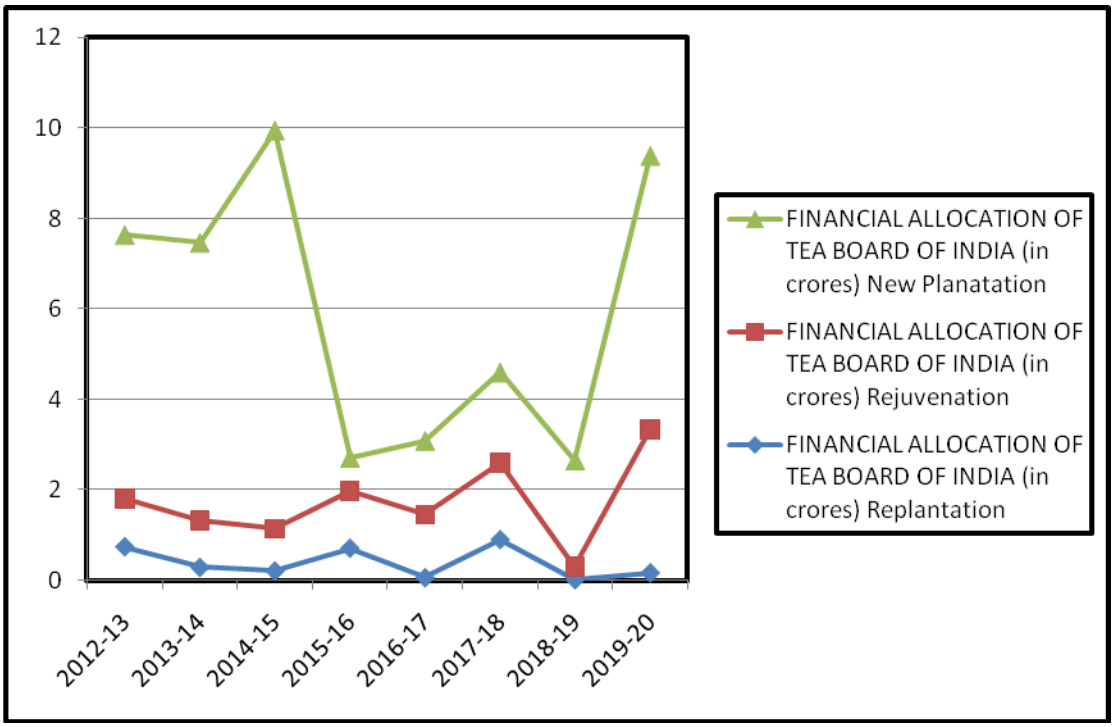
TBIs COVERAGE FOR NEWPLANTATION (in ha)



New plantation program was initiated to maintain a high yield and covered a significantly higher area in hectare for the year 2012-13 for 1056.62 ha,it was 1002.56 ha for 2014-15 and comparatively lower for 2015-16 with 63.7 ha.The allocation for 2016-17,2017-18,2018-19 and 2019-20 for new plantation was 192.18 ha,189.18 ha ,170.18 and 349.5.

Fig- 3.4

FINANCIAL ALLOCATION OF TBI (2012-2020)



Financial allocation by Tea Board of India for new plantation, Rejuvenation and Replantation follows the same trend with a declining trend for the year 2012-13,2013-14,2013-14,2014-15 and 2015-16.Then it took a upward turn for the year 2016-17,2017-18 with a steep fall in 2018-19.But again it is showing a sharp rise in the year of 2019-20.

3.4 ROLE OF SMALL TEA GROWERS DIRECTORATE

Tea Board of India has set up s directorate for small tea growers at Dibrugarh. The directorate had to effectively deal with the problems

faced by the small tea growers. The directorate is also initiating a process to establish a relationship between the associations of STGs and bought leaf factories to increase cooperation and coordination. It has also initiated a monitoring authority under district administration to ensure a better livelihood.

3.5 TEA RESEARCH ASSOCIATION AND ITS PROGRAM

Tea Research Association is the pioneer of tea research in organized manner formed in the year of 1911 at Tocklai, Jorhat. Initially, it was a small initiative but it gained momentum over time with a capacity to become the largest and oldest tea research institute in the world.

The present form of Tea Research Association began its operation in 1964 by taking over the management of Tocklai experimental station. Again in the year of 1924, Tocklai Tea Research Association has been renamed as Tocklai Tea research Institute receiving subscription from tea companies ministry and grant in aid from the commerce ministry, Government of India linked by Tea board of India.

TRA plays an important role to serve the tea industry by bringing technological innovation to the field in different time which increases the productivity. As per records, in 1951 the production of tea was calculated to be 234 million kgs which has been increased to 797 million kgs in 2012. The research and development capacity of Tocklai contributed to both

production and processing of tea with an objective to improve productivity and quality.

The category through which TRA provides its service can be drawn as follows:

3.5.1PLANT IMPROVEMENT AND BIOTECHNOLOGY

The growth and development of Indian Tea industry is largely dependent on the tea plant improvement. Tocklai has introduced a fair number of cultivators for a number of years.The tea cultivator received standardization of vegetative propagation and three clones namely $TV_{1,}$ $TV2_2$ and TV_3 are being applied. The numbers of clones that being selected and breeding.

Tocklai Research Association is also associated with the genetic research where different tea genotypes or germ plasmas has been collected, conserved and finally applied on the practical fields. A biotechnical research initiative of TRA is undergoing and profiling a gene-expression is taken as their part of research.

3.5.2 AGRONOMY

In the fields of agronomy, TRA has conducted a number of research on finding optimum plant population per hectare and derived a standard framework. Pre-planting activities recommendation with guideline is prepared on planting starting from baby plant to the stage of plants to be

pruned. TRA has a distinct role to bring efficiency in harvesting methods where plucking of shoots is a major part of activity with 60-70 percent of work force is deployed for this stage and highly significant for the economy of estates.The organization also provides guidelines for use of manures and vermicompost and reduction in the use of synthetic fertilizer with scientific pruning is encouraged.

3.5.3 OTHER ACTIVITIES OF TRA

Other activities include expansion of organic tea and Tocklai Tea Research Association has been encouraging on vermicompost in tea estates through their experiments to multiply the production of organic tea. It also works with a GIS (Geographic Information System) platform to alarm on extreme weather condition, clone development, improvement in soil and use innovation in tea processing technology. Training program of the TRA has a direction towards efficient transfer of technology in the tea growing field.

3.5.4 SPECIAL INITIATIVES FOR SMALL TEA GROWERS UNDER MISSION QUALITEA

Tocklai Tea Research Institute was earlier combined to the training and research initiatives for large estates only. The growth of small tea growers has made it inevitable for research and training program for them and Government has entrusted TRA to begin a program under “Mission Assam Qualitea”, TRA usually organize one day workshop and small tea

growers of different regions of Assam included in the program. A total of 4472 numbers of small tea growers are covered till February, 2019. The South Bank region where district of Golaghat is situated is also targeted for this program and a total of 667 STGs participated from seven different blocks of Golaghat during this period as per record of TRA.

Table-3.2 STGs PARTICIPATION IN WORKSHOP

SL NO.	Block	No. Participants
1	Gomari	102
2	Kothalguri	97
3	Central Golaghat	85
4	East Golaghat	86
5	West Golaghat	91
6	South Golaghat	81
7	Morongi	125
8	Total	667

Source-Tocklai Tea Research Association

It is viewed that small tea growers has deficiency in technical knowledge of tea management as most of them has participated in this business based on observation. The lack of training sometimes end up with poor yield and production of low quality tea leaves. It is important to maintain a good plucking standard along with better management of tea field with smooth transportation, training is necessary for optimal process of tipping and plucking in tea cultivation, farmers should have knowledge of pruning and old weather practices, desirable process of fertilities, use of

vermicompost and disease management and adaptation of PPC or Plant Protection Code.

3.6BOUGHT LEAF FACTORIES ROLE

Bought leaf factories and its growth is more of priority based with respect to the areas where supply of green leaf is assured and at the same time the capacity of the existing tea factories in handling tea leaf is not sufficient as compared to the available supply of green leaves. On the other hand, in some areas the tea growers are at far off places where processing units are not available. To counter these problems, bought leaf factories are granted in those areas under the TMCO or Tea Marketing Control Order of 2003.

The concern for quality in case of bought leaf factories output is high because BLFs do not posses any tea gardens or participate in the production of green leaves. The green leaves collected through agents have a lesser possibility to comply with quality standards. However, most of the BLFs in Golaghat district have a recent tendency to follow up the quality standards suggested by the “Trust Tea” so that reputed brokers such as Unilever, Brooke Bond and other broking houses can directly purchase their product. A good number of bought leaf factories has emphasized on purchasing of fine count or increase the percentage of fine count tea which is more popularly known as “Two leaves and a bud” and these plucked leaves are made subjected to pass through a turf for 60-70 percent

withering. The BLFS take the responsibility of segregation of green leaves collected from STGs in their unit. Bought leaf factories decision on pricing which is mostly effected by the fluctuations in the final price of tea and price adjustment of green leaves takes place according to the prevailing market price on real time basis. Cost of producing tea has a direct linkage to the bought leaf factories decision on purchasing as well as production of tea .It is found that cost of production of tea is at inclining trend due to increase in the man days cost, price of coal and other management cost. Most of the bought leaf factories used to offer advance money to the small tea growers during the non plucking season to manage the cost of maintenance such as tipping, drainage clearance and manuring which could be realized during the plucking season. Bought leaf factories tied up with the small tea growers of the areas for collection of leaves on agreed terms such as handling of leaves, carrying of leaves with fine count of which at least 50 percent should be of fine based.Moreover, overloading of leaves in the carrier vehicles is not allowed. During rainy season 5-10 percent water content in the leaves are taken care of and for transparency, price list is being displayed with fine percentage and rate.

3.6.1 MARKETING PRACTICE AND PRICE FIXATION OF BLFs

BLFs offer price for the STGs green leaves is always lower than the estate factory price based on a perception in auction market that that quality of BLFs made tea is of inferior quality as compared to the estate

factories .BLFs are more of unorganized and their dependence on direct sale in high. In the direct selling method, the credit timing is considerably high which has a negative effect on BLFs price .The technological exposure of BLFs is relatively low has negative impact on the production of made tea. In an overall performance, from processing to packaging the price fetched by BLFs is lower. On competitive scale, BLFs suffers from various issues which have a direct as well as indirect effect on STGs product price in the supply chain .

3.7 SELF HELP GROUP AND ITS ROLE

SHG or a self help group is an informal body comprising of minimum 15 members and maximum of 20 members from the small tea growers with any limit of overall controlled area .Self help group is a voluntary formation which promotes savings and gather resources that can be helpful for the members. Specifically a basic SHG doesnot need to show any land holding SHGs can avail harvesting and pruning machine and subsidies from the Tea Board of India. SHG can claim common facilities within 12 months from the date of issuance of PAAR or pre activities acknowledgement receipts. However, by forming a group more than the maximum limit SHGs needs to be upgraded to FPO or farmers produces organization for better all round function.

Farmers producers organization is a collective approach for the small tea growers, as an individual producer they could not sum up to be in higher volume in terms of inputs or product. A collective approach in terms of FPO is eligible to draw the benefits of economies of scale. The FPO is an organization which can take care of various functions with its launching of feasibility assessment and planning of the business by following a service model. It can be further organized to add up the clusters as a necessary criteria and decision needs to be taken to transform it into FPC or Farmers Producers Company it necessary.

In Golaghat district, it is found during the field study that the farmer producers organization is at a growing stage as small tea farmers at present are not well convergent or well equipped to further transform it into a company under the companies act.

3.7.1 ACTIVITIES UNDERTAKEN BY SHGs ESTABLISHED BY STG

Self help groups are the associations of small tea growers through which they can take part in marketing of their produce collectively by creating a type of distribution channel. Self help groups in any of the three recommended forms such as basic SHG, FPO or farmer's producer's organization and FPC is more commonly known as farmer's producers company can be organized to take part in development activities for small tea growers.

Self help groups can organize a revolving corpus fund to purchase the inputs to protect the plants, the growth of the plants and prevention of the self help group should endorse the revolving corpus necessary for the yearly expenditure for prior approval and subsequently the management committee reimburses the expenditure with top up necessary for it. The scheme under the TBI encourage the SHGs in FPO forms to set up of godowns and one shed for 3000 kg of harvested leaf, allotment of capital goods and encouraging FPOs to build up processing units.

3.7.2 SELF HELP GROUPS OF SMALL TEA GROWERS: CASE OF GOLAGHAT DISTRICT

In Golaghat district of Assam, a number of registered self help groups can be seen but in actual practice, only three self help groups formed by the small tea growers is significantly contributing towards the cause of the small tea growers. The basic objective that could be identified in formation of self help groups in the form of producer's organization of small tea growers is creation of direct marketing channel with their respective estate factories as well as bought leaf tea factories. In this system, commission and arbitrary price imposed by the collective agents could be avoided. In Golaghat district, the small tea growers always has a dissatisfactory state thriving for a fair price for their green leaves but almost for more than ninety percent of the small tea growers, it has become pertinent to agree to the price offered by the collection agents to averse the

risk and the cost of carrying the product to the factory. Due to this price offered by the agents which is always below the expected price and the decision taken between the agent and factories always has a tendency to derive out the maximum profit. In this connection to overcome the transportation program,TBI provides loan with subsidy to own carrier vehicle.

If small tea grower has registration under SHG, he has to supply leaves through the SHG and registration is undertaken with monthly fee. The labour charge for carrying the leaves has to be taken care of by the grower which is normally fixed at the rate of Rs .50(Fifty paise) per kilogram of green leaves. The corpus fund generated from the aid of the Tea Board of India needs to be utilized for the purpose set in the regulation and profit generated has to be invested in the fund. The fund is again recycled for a year starting from December. In some cases, loans are granted from the fund to the member of the SHG with a nominal interest chargeable and members are accountable in cases of getting access to the fund. Annual meeting is held for any addition or amendment of terms and training is being encouraged meant for SHGs organized by Tocklai Tea Research Association.

The self help group of small tea growers which is present in the region is in the form of farmer producer's organization and is being registered under the Society's Act, 1860. The accounts of small tea growers is being maintained by using the general accounting principle to

adhere transparency. It is found that self help groups used to possess vehicle ranging from one to fourteen for carrying leaves and East Morongi SHG has highest number of fourteen vehicles for carrying leaves till 2020. The carrying cost in the year is fixed at 10 percent per kg of tea leaves recently. SHGs like East Morongi has initiated a drive to acquire certificate of trust tea for 300 STGs . As per guideline of the TBI, the SHGs used to provide inputs such as fertilizers and weedicides from their corpus funds and they used to release an amount equal to rupees 25 lacs per annum. The forum of SHGs are vocal in fighting against underrated price, cost issues, dealing with labour problem and management, quality consciousness training programs organized on monthly basis and conduct yearly meeting, deriving a future plan by conducting audit in presence of observer. Through formation of SHG, they could pursue the TBI to conduct soil test to be done under the Tea Husbandry department of Assam Agricultural University at Jorhat .

Table-3.3 **STATUS OF SHG IN GOLAGHAT DISTRICT (YEAR 2020)**

Sl no	Name	Year of formation	Block	No. of cultivators	Acreage in ha	Head quarter
1	East Morongi	2001	Morongi	300	75	Thuramukh
2	FANAP	2003	Morongi	102	54	Morongi
3	Sanjivani	2006	Kothalguri	30	24.8	Hensua

Source-Field survey

3.7.3 PARTICIPATION OF TRAINING BY SHGs

Training for the SHGs are undertaken through the initiative of Assam government and Tocklai Tea Research Association in the line of maintaining the quality of tea which is highly dependent on some factors such as processing technique, location, colour, flavour and taste. It is emphasized that plucking should be conducted in Assam and North Eastern state in every seven days or weekly basis so that all necessary chemical properties of tea remain intact. Packaging and optimum handling of tea bags to a size of 15 kgs is necessary to keep the temperature below 35^0C or overloading may cause dried up of leaves. Training is being given on process of tipping and plucking of tea cultivation and maintenance of the foliage layer. During training for plucking skill building for the standard plucking, fine plucking and black plucking is being demonstrated . The training is aimed at pruning procedure in tea and other cold weather practices , process of fertilizer application in tea cultivation with restoration of nutrient is encouraged and information is being given to maintain the soil PH within the range of 4.5 - 5.5. Farmers are provided guidance for balance use of vermicompost fertilizer for organic. The most important part of this training is to introduce PPC as plant protective code, to maintain recommended threshold for maximum residue limit prescribed by the tea board of India. Under the plant protective code, a recommended time and quality limit of insecticides and its application, spraying methods. Spot application knowledge on usage of Tocklai Research Association's

recommended insecticides and clearing out the drain to obstruct-predators are being shared to the SHGs.

Hannan (2017) in his study has observed that during the tenth plan period, the growth of SHG (self help group) is not promising or it is not getting a desired momentum although the STGs are growing at a continuous rate. The reason behind this is the clandestine arrangement between the leaf agents and factory owners which acts as a deterrent for illiterate and unorganized form of STG farmers which reduces exposure to market structure. SHGs have strong potential to guarantee rural employment, reduce uncertainly, formation of micro-enterprises, pool of credit, better management of farm and application of input. But in actual practice the strategic formation of SHG is facing deficiency which could be helpful to break market barrier and enhance the capacity by inducing economies of scale. The recent need of application of appropriate technology could be initiated with proper modeling of it.

3.8 ALL ASSAM SMALL TEA GROWERS ASSOCIATION (AASTGA)

All Assam Small Tea Growers Association was established in the year of 1988. AASTGA which has a member of over 20,000 in Golaghat district of Assam is linked to a separate directorate in Dibrugarh Assam .This organization has demand for price stability for green leaves irrespective of any seasonality and emphasis the authority to control the price of tea leaves

in such a manner that STGs can overcome any form of loss. The AASTGA has set one benchmark for minimum price of green leaves to be Rs.17 per kg and below which the STGs have a stronger possibility to suffer losses. The price stabilization fund and price saving formula derived by Tea Board of India based on price spectrum band for STGs green leaves was not effective or it did not ensure any gain. According to AASTGA the STGs which fall in the segment of plantation area (0-3) hectares has a dominant presence of over 60 percent and they are also termed to be a marginal farmer who needs immediate attention from TBI. The association has also encouraged on organic farming or transition to organic farming for existing STGs which could ensure a steady profit with growth in a sustainable manner. The STGs initiative for organic farming would reduce the negative impact on ecology by reducing emission caused by spraying of nutrients fertilizers and weedicides. As per record of 2019, STGs under AASTGA has around 1.72 lakh growers with 12.8 lakh of workers with 103 regional branches with a plantation area of 89,948 hectares which has a production of 1023.64 million kgs contribute around 51.04% of total production. AASTGA has demanded the government to shift the STGs department from industry to bring under agriculture department so that the farmers could access the subsidy meant for plantation, irrigation, manure, machines for pruning and plucking aid to STGs for its better development.

3.8.1 AASTGAs DEMAND TO THE GOVERNMENT

The association has demanded that the government should issue land pattas to STGs up to a limit of 75 bighas.Pressure has been exerted on government to take necessary steps for security of life and livelihood. It also proposed the government to keep tea industry under an independent ministry with a branding of tea with proper realization of price of STGs product.

3.9 NORTH EAST TEA ASSOCIATIONS (NETA)ROLE

North East Tea Association (NETA)was established in the 1981 in a direction to bring overall development to the tea industry. It has a mission to cater the needs of the small and marginal tea gardens. NETA has a role to minimize the statutory obligation for small farmers and cooperated with the small and marginal farmers to enable them to avail the financial facilities .At the same time NETA was institutional to bring down the shocks that may be encountered by small and minimal farmers from various quarters of industry. NETA has worked in the matter of rationalization of excise zones where the low yielding and high cost tea gardens of Golaghat was clustered together with high yielding tea gardens of upper Assam.

In view of ever fluctuating demand and supply NETA has emphasized for a control over production so that market can be stabilized and introduce a system which can control at the end of production season. Tea industry is passing through a rough phase in 1999 and a small tea

grower under NETA is also facing the volatility in the market. Association like NETA has felt it to be imperative to decide closely on the auction decision with a common interest. According to NETA's claim, this kind of activity was conducive to gain strength for the small tea growers since 2000.

A balancing act on demand supply has a continuous challenge as tea production in Assam has a peak season of 5 month starting from June to October. During this peak, in Assam a phenomenon of continuous price decline has been creating a dampening effect among the farmers and as a result almost 75 percent of the tea supply is less than pass through a decay in revenue. By looking into this pattern , NETA is encouraging farmers to grow tea with a quality rather than more supply.

3.10 ROLE OF QUALITY COMPLIANCE ASSESSORS AT PRESENT

3.10.1 ROLE OF TRUST TEA

The trust tea organization has been entrusted with the assessment of overall compliance and quality performance of tea producing entities with a 360 degree inclusion. The certification of trust tea is beneficial for the Bought Leaf Tea Factories to directly attract the large brokers with an expectation to gain in price. The trust tea code version-2 is designed to entice all performance parameters of Indian tea estates, bought leaf tea factories (BLFs) and small tea growers (STGs) with regard to social, economic, agronomic and environment. Trust Tea has recommended

certain control points and after verification, they send the audited reports to the certifying bodies. The mandatory control points needs to be complied at 100% and other criteria needs to be fulfilled in 50% in first year, 65% in second year and 80% in the third year.

In Golaghat, the STGs have to comply with the trust tea recommendation.At present, from STGs information sharing domain, it is found that most of the farmers are ignorant about the criteria. The growing prominence of trust tea in tea cultivated areas will have over helming effect on STGs in future. The days are nearing where the absence of trust tea tag may result under pricing of product for both STGs and Bought Leaf Tea Factories.

3.10.2EMPANELLED CERTIFYING BODIES AND HACCP

Tea Board of India recognizes certification bodies and empanel then based on their fulfillment of criteria. The main aim of the certifying bodies is to verify CODEX HACCP based food management system with standard certification practice such as ISO 22000, RVA DUTCH HACCP, BRC, FS 22000, Synergy 22000 and other accredited certification.

3.10.3 HACCP (HAZARD ANALYSIS AND CRITICAL CONTROL POINT)

Hazard Analysis and Critical Control Point is a prominent measure to target critical areas such as processing and reduce the risk of manufacturing which has a direction to trace out sell of unsafe products.

CCP or Critical Control Point is based on location, the practice, the procedure of a process.

HACCP is structured with seven different principles which needed to be set up, implement and maintain a HACCP plan during its operation in tea sector. HACCP is based on seven principles such as conduct a hazard analysis, determine critical control points, apply preventive measures by setting critical limits, adjustment and measuring of critical control points ,detection of deviations and its corrective controls, follow up procedures and finally proper documentation with mention of principles.

3.11 PERCEPTION AND LEVEL OF SATISFACTION OF SMALL TEA GROWERS IN GOLAGHAT DISTRICT

Perception and level of satisfaction of small tea growers on the institutional role can be useful in assessing the status of its effectiveness and efficiency for better growth and performance dimension to its beneficiary. Small tea growers in the Golaghat district by its demographic profile, more of cultivators with high school qualification with lesser numbers in tertiary education can have an influencing effect on their adaptability to the new technology, government schemes, market information and financial build up.

Strong and positive perception towards the institutions with a higher level of satisfaction is crucial for organization's success. Perception according to Merriam Webster (2015) is the way one thing or understands someone or something that has a pivotal role in decision making of

business for producers and entrepreneur associated with the field of agriculture. The socio-economic background of different tea growing farmers leads to the development of a different perception in role dimensions connected to different structures and as per availability of opportunities. Perception of STGs may differ in different occasions but have certain common goals that are essentially needed to be fulfilled. Perception of STGs is developed with some different dimensions but it is most important that they need to converge to achieve a desired performance level. Similarly, the level of satisfaction is dependent on the past experience with an institution and level of satisfaction is high if the difference between expectation and relative experience is significantly low.

On perception, Sell (1977) has extensively studied on relationship of role ambiguity to the performance of employee ability with perception and satisfaction. The higher ability of employee in an organization is less effected by role ambiguity than employee with lower ability.Renko et. al (2012) has expressed that perception tries to give a shape based on known knowledge or unknown knowledge.

Perception percolates into a mind to make an ability which can visualize the strategy. It can also accelerate the competitive environment working as a driving force. Aan Hardinyana (2015) has identified perception to be a collective force which influences one's mind to decide whether to stick to the organization and willingness to reach well to value by exerting effort.

Satisfaction has a wide spectrum phenomenon for the small tea growers which develop an expectation based on perception which meets a favourable design with smooth service delivery. Schultz (1962) has opined that community satisfaction is a broad concept where sub concepts club together to work with a physical situation of community where a growing and existing situation brings satisfaction to the community with economic wellbeing.

Institutional role in case of small tea growers of Golaghat district can be visualized in case of perception build up and in attaining a level of satisfaction for four different activities which are role of administrative structure, financial inclusion of STGs, marketing activity and role of training and knowledge sharing to bring better performance to their domain .A survey is conducted for the study by covering all eight development blocks of Golaghat district. Cronbach's Alpha has been used to test the consistency and reliability of the questions.

Table-3.4 RESULTS ON CRONBACH's ALPHA

Sl.no	category	Perception	Satisfaction
1	Administrative Structure(Six dimensions)	0.815	0.915
2	Financial Inclusion(Six dimensions)	0.893	0.936
3	Marketing activity(eight dimensions)	0.707	0.863
4	Training(Six dimensions)	0.732	0.909

Source-Survey

The reliability and consistency of dimensions of perceptions and satisfactions for the small tea growers in Golaghat district is being

measured in terms of Cronbach's Alpha score. The Alpha score for perception and satisfaction for existing administrative structure is found to be 0.815 and 0.915 which is significant for six dimensions. The perception and satisfaction for financial inclusion with six dimensions is 0.893 and 0.936.The alpha score for perception and satisfaction for eight dimensions for marketing activity was measured to be 0.707 and 0.863.The perception and satisfaction for training and knowledge sharing for six dimension is 0.732 and 0.909.The higher alpha score ensures higher reliability and consistency of dimensions. While conducting the survey ,a 7 point Likert scale was used where 1-strongly disagree, 2= disagree, 3=somehow disagree, 4= noresponse, 5= somehow agree, 6= agree and 7=strongly agree.

3.11.1PERCEPTION AND SATISFACTION LEVEL RESULTS ON ADMINISTRATIVE STRUCTURE

The administrative structure which has a close relationship with the STGs in providing direction on regulatory as well as direction on service delivery needs and statutory control under the apex body known as Tea Board of India has a Directorate for Small Tea Growers in Dibrugarh, Assam. Tea Board of India works under the control of central government and ministry of commerce and industry of government of India. The function of the board which covers U/S 10 of Tea Act is multidimensional by nature and it works in a direction to increase the level of production and productivity of tea, improves the quality of tea, increases co-operative

activities by encourage SHGs, support tea research and promotes export and domestic consumption, delivers licensing and regulatory duties, undertake welfare measure and maintain tea statistics. All Assam Tea Growers Association is a vocal body to address the issues related to the STGs and works towards streamlining the green leaves supply and bring quality consciousness to gain better price. The organization also stresses on gaining fair price and persuade the government to follow up liberalized land regulation. They also initiate drive for minimum price and demand for subsidy from government side.

The survey is conducted to find out the perception and satisfaction level of STG as suppliers of green leaves and its relationship with the administrative bodies. Whereas ,satisfaction level of STGs is dependent on the expectation based on perception towards the existing system.

Table-3.5 ADMINISTRATIVE STRUCTURE RESULTS

Results-> / Dimensions ↓	K-S test (Sig)	Mean	R Between 'P' & 'S'	S D of Pand S
A_1	.000	P=4.04 S=2.12	.150	P=.672 S=1.19
A_2	.000	P=5.09 S=2.05	-.252	P=.88 S=1.28
A_3	.000	P=4.05 S=1.70	-.062	P=.55 S=1.43
A_4	.000	P=3.94 S=1.67	.156	P=.53 S=1.43
A_5	.000	P=3.98 S=1.67	-.455	P=.49 S=1.18
A_6	.000	P=4.04 S=1.32	-.434	P=.58 S=.722

For the study of administrative structure six dimensions are considered for the perception and satisfaction level of the small tea growers in Golaghat district .The dimension A_1 is supportive and cooperative structure,A_2 is efficiency in implementing programs/schemes,A_3 is good communication in sharing knowledge and information,A_4 is availability of good data base system,A_5 is Adequate control over market and A_6 is preventing irregularities and market deficiency.

Taking satisfaction level of small tea growers as dependent on the perception which draws a line of expectation that can ultimately determine the level of satisfaction. In this regard, based on the significance result of K-S normality test,Wilcoxon's signed test was conducted .

Table-3.6 RESULTS FROM WILCOXON SIGN RANK TEST FOR ADMINISTRATIVE STRUCTURE

Dimensions	Positive Rank	Negative Rank	Tie	Z	Sig
A1	19	364	17	-15.38	0
A2	22	349	29	16.52	0
A3	20	369	11	-17.23	0
A4	29	303	68	-15.36	0
A5	29	336	35	-26.52	0
A6	17	381	2	-17.38	0

The results shows a significant difference in variables and the higher presence of negative ranks shows that expectation on satisfaction level is more intense than the perception in this regard. The probability associated with the Z-statistic shows difference is indeed significant.

From the table, the mean difference in between perception and level of satisfaction is prominent for the dimension A2, A3, A5 and A6 which means the efficiency in implementing programs/schemes, existence of good communication, adequate control over market in preventing deficiency and market shortfall. The standard deviation value shows higher in case of responses for the satisfaction level as compared to the responses for perception across six dimensions. The higher standard deviation incase of satisfaction level shows the dispersion is higher in relation to perception. The Pearson's R between Perception and Satisfaction in case of A_5 and A_6 has a highly significant but with a negative score of -.455 and -.434.

3.11.2PERCEPTION AND SATISFACTION RESULTS ON FINANCIAL INCLUSION

Financial inclusion on STGs is dependent on the design followed by the providing agencies which can favour a sustainable cultivation and generate employment, the small tea growers due to its unorganized nature works below optimality in terms of production decision, technological and other input, low access to advising services. The statutory problems faced by STGs in terms of due diligence and more specifically absence of land holding documents which discourages them to avail financial resources mainly loans and other grants from banks and other financial institutions. L. C Jain committee has suggested that STGs can be included in the financial ambit by advancing loan through the route of large estates and tea processing factories those who purchase green leaves from them and keep

up to date records. Tea Board of India also has a subsidy scheme for STGs to convert the ceiling surplus and other cultivable lands in upper Assam districts.

The subsidy is directed to purchase inputs such as planting materials, purchase of fertilizers, weedicides, pesticides, assistance against loss of income due to any production loss and subsidy in interest loan with applicable conditions. NABARD or National Bank for Agricultural and Rural Development has collaborated with Assam co-operative Apex Bank for refinancing of loans. Financial inclusion of STGs can be assessed for eight development blocks of Golaghat districts with six different dimensions which is vital to ensure its effectiveness. The overall situation of financial inclusion of STGs can be analysed as per result obtained from the survey.

Table-3.7**FINANCIAL INCLUSION RESULTS**

Results → / Dimensions ↓	K-S test (Sig)	Mean	R Between 'P' & 'S'	SD for P and S
F_1	.000	P=3.64 S=1.76	-.237	P=.916 S=1.02
F_2	.000	P=3.47 S=1.64	-.270	P=.74 S=.98
F_3	.000	P=3.55 S=2.00	-.038	P=.76 S=1.71
F_4	.000	P=4.60 S=2.36	-.018	P=1.01 S=1.86
F_5	.000	P=4.64 S=1.87	-.093	P=1.81 S=1.44
F_6	.000	P=3.58 S=2.59	-.079	P=.75 S=2.07

The six dimension for financial inclusion is F_1-Availability of adequate financial support,F_2-Maintaining a good ratio in terms of loan to the landholding and number of beneficiaries,F_3-Availability of financial scheme,F_4-Satisfactory loan repayments,F_5-low rate of interest added with subsidy and F_6 –good financial supervision. After that K-S normality test was conducted this shows non normal results for responses.

Table-3.8 RESULTS ON WILCOXON SIGN RANK TEST ON FINANICIAL INCLUSION

Dimensions	Positive Rank	Negative Rank	Tie	Z	Sig
F1	17	323	60	-14.3	0.000
F2	17	335	48	-14.58	0.000
F3	30	114	254	-7.52	0.000
F4	32	292	76	-14.24	0.000
F5	16	83	301	-7.18	0.000
F6	15	94	291	-8.2	0.000

In case of financial inclusion, the result shows a higher negative ranks that shows expectation on satisfaction is more intense than the perception. The correlation score R is very low for perception and satisfaction level across the dimension which is not significant. The standard deviation results for satisfaction shows higher dispersion in responses than the perception.

3.11.3 PERCEPTION AND SATISFACTION RESULTS ON MARKETING ACTIVITY

Marketing of STGs product or the green leaves is primarily channelized through collection agents or middlemen who carry the green leaves to the respective Bought Leaf Factories and large estates for its processing. BLFs are solely dependent on the STGs supply and their decision on price fixing is crucial. Most of the Bought Leaf Tea Factories in Golaghat District prefer to sell their product in direct selling mode in contrary to large estates processing units which has strong inclination for nearby auction market. BLFs rely more on direct selling because of their quality compliance issues which is being recently settled through obtaining certificate from assessors such as HACCP and trust tea which enables them to directly tag their product with prominent brokers such as Unilever, Brook Bond and other players. Although the Guwahati Tea Auction Centre (GTAC) and Kolkata Tea Auction Centre is responsible for selling the processed or made tea but their activities can strongly send signals in regard to price and demand for quantity of leaves. SHG or Self Help Group is being organized to counter the unexpected behaviour of collection agents in fixing price and quantity of leaves which sometimes create a situation of underperformance of SHGs. But in Golaghat district. The role of SHGs is still to attain prominence as the collection agents already had considerable dominance in the green Tea leaves market.

TMCO or Tea Marketing Control Order by Tea board of India has come into the force from the year of 2003. Under TMCO, the price of the green leaves needs to be controlled under a formula designed in favour of STGs which is known as PSF or Price Sharing Formula with a reasonable price being offered to STGs. At the same time the large factories needs to share the information of their volume of product with the Tea Board which can ensure a right supply as per demand by bringing transparency. In this process, the sale proceeds received by registered manufacture should have parity with PSF.Any difference occurs in between realized price and actual price can be compensated from sale proceeds of made tea.

Most of the STGs are effected by asymmetry in market information. So, they are unable to fetch the perceived price. Renko et al, (2002) has opined in their study that market of agricultural products is the involvement of all direct and indirect participants which is like a chain ranging from production to consumption, Institutional support affect in large extent of functioning of market. It should intensify competiveness of local structure which can integrate the market both in horizontal and vertical way.

Institutional role is the key to ensure well functioning of different dimensions of market. In this study, the marketing activity of the STGs is assessed with six important dimensions which includes opportunities present in the market, presence of efficient distribution system, existence of good pricing mechanism, status of forward contract price, Bought leaf factories role in fulfilling expectation of STGs, auction markets role is

whether satisfactory or not, market expenses are within control limit and pricing in practice which brings good return in investment. The various results are obtained from the survey conducted which can be analysed as below:

Table-3.9 RESULTS ON MARKETING ACTIVITY

Results-> / Dimensions	K-S test (Sig)	Mean	R Between 'P' & 'S'	SD for P and S
M_1	.000	P=4.27 S=4.1	.177	P=.70 S=1.20
M_2	.000	P=4.13 S=2.85	-.041	P=.59 S=1.18
M_3	.000	P=4.24 S=2.4	.290	P=.45 S=1.10
M_4	.000	P=3.90 S=2.5	.460	P=1.10 S=.93
M_5	.000	P=4.18 S=2.06	.373	P=.61 S=.56
M_6	.000	P=4.15 S=1.60	.091	P=.42 S=.88
M_7	.000	P=4.23 S=1.86	.306	P=.42 S=1.26
M_8	.000	P=4.21 S=1.87	.225	P=.56 S=1.26

Marketing activity is considered for perception and level of satisfaction among small tea growers for eight dimensions are M_1-opportunities vailable,M_2-distribution channels efficiency,M_3-good pricing mechanism,M_4-status of forward contract price,M_5-Bought leaf factories role,M_6-satisfactory role of auction market ,M_7 on cost of marketing and M8-good return on price. Across all eight dimensions for marketing activity value for K-S test for normality shows the distribution of responses to be non normal.

Table-3.10 RESULTS ON WILCOXON SIGN RANK TEST ON MARKETING ACTIVITY

Dimensions	Positive Rank	Negative Rank	Tie	Z	Sig
M1	76	112	212	-2.32	0.020
M2	33	324	43	-13.96	0.000
M3	21	355	24	-16.96	0.000
M4	0	347	53	-16.62	0.000
M5	0	389	11	-17.42	0.000
M6	0	390	10	-17.69	0.000
M7	18	365	17	-17.01	0 .000
M8	11	358	31	-16.45	.0000

Marketing activity also shows more inclination towards negative ranks with low positive score having intense favourable expectation towards satisfaction level than perception. Only for M1 ,the result on tie is high which shows a low gap in between perception and satisfaction level.

The mean difference for dimensions M_6, M7 and M_8 is comparatively higher than other dimensions. The correlation R between perception and satisfaction is high for M_4,M_5 and M_7.The standard deviation result for perception and satisfaction level shows higher deviations in case of perception for M4 and M5 but for M1,M2,M3,M6 and M8 the dispersion of satisfaction level is higher than perception.

3.11.4 PERCEPTION AND SATISFACTION RESULTS ON TRAINING AND KNOWLEDGE SHARING

Training need for the small tea growers was not rightly realized during the early period of its emergence. But in recent times, most of the STGs are in the opinion that training brings substantial difference in quality by adaptation of new techniques of plantation. At the same time, they agree that the number of increases in training programs reduces the flaws and at least STGs should gather adequate knowledge of soil contamination due to excess use of chemicals which can be brought to a limit by using recommended quantity. However, Tea Board of India is instrumental to bring the new technology and research initiatives to the tea cultivators with collaboration with Tea Research Association of Tocklai.

In Malawi and Kenya in Africa, UTZ certification has taken widespread initiatives for more sustainable and better farming methods for the small tea growers in the African region with an aim, Known as training to practice. In Malawi they achieved certain objectives such as tea bush with correct height, application of crop protection, application of less fertilizer, better income due to certification with corrective action improvements on perception on livelihood quality. In Kenya also, training under UTZ has increased agronomic efficiency, reduction in production cost with rise in prices. Training of Tea Board of India has a mission to improve the quality of tea by setting plucking standards, better treatment of

tea leaves, process of tipping management, optimal use of fertilizer and to transform into organic with a rest management.

Dhanakumar (1999) and Ramu (1999) has identified the importance of training and extension services for small tea growers. They have emphasized on need of demonstration for appropriate tea production technologies which can build up capacity, lab to land program, better irrigation model and intensify the co-operation practices with extension of new planting, rejuvenation and infilling management. Knowledge sharing is an integral part of knowledge management. As per study of Shihong Xiao et al,(2020) knowledge sharing increases motivation and by learning from different sources one can internalize into their own system. Knowledge distribution is equally important especially in a situation of post learning from the farmer's side. Schubert (2012) has identified for small holder farmers knowledge is a power where training and extension services can lead to better livelihood with sharing of information on technologies and making it possible to have market access by reducing asymmetries with more participation at the same time.

Perception and level of satisfaction of small tea growers of Golaghat district on avenues of training and knowledge sharing is being evaluated on the basis of six different dimensions analogous to institutional training and knowledge sharing which can work on improvement on productivity, reduction of flaws, enhances quality, helps in smooth transfer

of technology, encourage good agriculture practice in agronomical and economic efficiency and finally ensures sustainability.

However, results drawn based on survey conducted for eight development blocks of Golaghat districts are as follows-

Table-3.11 TRAINING AND KNOWLEDGE SHARING RESULTS

Results→ / Dimensions	K-S test (Sig)	Mean	R between P and S	SD between P and S
T_1	.000	P=4.28 S=3.01	.514	P=.64 S=1.32
T_2	.000	P=4.2 S=3.04	.546	P=.58 S=1.31
T_3	.000	P=4.25 S=3.58	.557	P=.58 S=1.71
T_4	.000	P=5.33 S=3.43	-.045	P=.83 S=1.74
T_5	.000	P=4.55 S=3.55	.599	P=.91 S=1.90
T_6	.000	P=6.31 S=6.25	.872	P=.79 S=.80

The six dimensions for perception and satisfaction level for small tea growers in case of Training and Knowledge sharing are related to T_1-Improves productivity,T_2-reduces flaws in the process,T_3-enhances quality,T_4-helps in transfer of technology,T_5-encourages good agricultural practice,T_6-Makes it more sustainability considered for the study.

The paired sample test shows lesser significant score as per K-S normality test and hence Wilcoxon's Sign Rank test was conducted.

Table-3.12 RESULTS ON WILCOXON SIGN RANK TEST ON TRAINING AND KNOWLEDGE SHARING

Dimensions	Positive Rank	Negative Rank	Tie	Z	Sig
T1	16	315	69	-14.12	0.000
T2	31	309	60	-14.59	0.000
T3	83	189	128	-8.74	0.000
T4	41	301	58	-13.86	0.000
T5	95	50	255	-2.82	0.05
T6	21	14	365	-0.12	0.904

In this section, for T1,T2,T3 and T4 ,the attitude towards satisfaction level is more intense than the perception. For T5 and T6, the higher concentration of tie results shows a non decisive mode and the mean difference between perception and satisfaction is also absent.

CHAPTER IV

PERFORMANCE OF SMALL TEA GROWERS

4.1 INTRODUCTION

In India, the policy makers have a strong inclination towards the socio-economic impact of its implementation. The evaluation of a policy and its need can be justified only after scanning is done by prioritizing the PESTEL (Political, Economic, Socio, Technological, and Legal) factors . The agriculture is the primary sector of the country and state of Assam is categorized as being in a developing stage where primary sector has a dominant size. The tea industry of Assam has a deep collaboration with agriculture for production of its basic raw materials known as “green leaves”. The characteristic of tea industry has created an extra space for the cultivation of tea to grow. The small tea growers are the integral part of the tea industry and without their presence, the wheel of tea industry will be in a standstill .Small tea growers emergence has both the elements of compulsion and motivation to adopt this form of cultivation .The growth of the small tea growers has eventually changed the paradigm of tea production of the state.

Small tea growers performance doesnot have an end point till their product reaches to the processing unit. The small tea grower performance is

indirectly affected by movement in different markets which is connected to the small tea growers product. The performance is not merely a volume based, it is the value created in each and every transaction of processing. The performance of the small tea growers is vital and the social welfare of the society is closely related to this form of cultivation. Small tea growers contribution doesnot merely add to the gross domestic product, but it ensures a livelihood, brings prosperity and security to the life of number of households. The output of the small tea growers also elevates the purchasing power position of the society which ultimately creates extra demand for goods and services in the market.

The small tea growers occupation has become an indispensable source of income and the sustainability of small tea growers is crucial for the local as well as state economy of Assam. More participation of rural people with an increasing trend has created a threat to its viability which can only be evaluated through performance indicators so that problems can be resolved whether it is related to market or ecological constraints.

During the eighth five year plan period (1991-95), Tea Board of India recognized the small tea growers to be a necessary element in the tea industry. From this plan period, only the growth of STGs was considered seriously and emphasis was drawn on its expansion towards the non-traditional belts. Earlier, the Nilgiri hills tract of Tamilnadu was considered to be non-traditional belt of growing tea had a usual practice of growing tea in small holdings followed by Assam and West Bengal. The growing

popularity with success has attracted the Kangra valley and North Eastern states of Nagaland, Arunachal Pradesh, Meghalaya and Sikkim to experiment this form of growing tea.

Small tea growers in Assam was purely an individual ownership business in which agricultural entrepreneurial skills were utilized to create a source of income in Golaghat district of Assam and considered this cash crop as an alternative to sugarcane. The initial drive of cultivation of it for a household income has led to its proliferation in the region. The number of STGs in the region is found to be 23400 as per estimates of 2020 provided by AASTGA. The estimated total land holding by STGs is 13900 hectare and production is 35.08 million kgs till 2020. Small tea growers play a vital role in maintaining the level of production as the level of production in green leaves is falling on the side of large tea estates in the districts where STGs has a strong presence. The growing numbers of small tea growers also fuelling the growth of production level. The competition in the market in case of tea industry is highly unpredictable due to various factors such as climatic variation, changes in demand, agronomical pattern, systemic problems faced by the tea growers due to price changes and rise in cost which can hinder to perform. The bought leaf factories always have a tendency to fix a lower price by citing various reasons to gain exponential profit.

An attempt has been made in this chapter to analyze the performance of STGs in Golaghat and in the state of Assam with the aid of

some selected indicators. The main objective of the STGs is to ensure a livelihood social welfare with economic well being by bringing efficiency and sustainability to this cultivation. An evaluation of financial performance is of paramount need for its sustainability and achievement of its objectives. A period of 2008-2020 for ten years is being considered for this research study.

4.2 BACKGROUND OF PERFORMANCE ANALYSIS WITH PARAMETERS

Performance of small tea growers should be analyzed in a practical way to assess its capacity to deliver goods and services in an optimal manner by minimizing the waste during its operation. The small tea growers performance should be able to achieve its goal in a most effective and efficient manner. According to Merriam Webster Dictionary – "Performance is the expectation of an action which can fulfill a claim". The recent phenomenon of growth of small tea growers should be driven by performance so that it can overcome the challenges to maintain the growth rate which has actually started from the year of 1990. The profitability of STGs should be able to be accompany with better liquidity position and a balance should be maintained in between financial and non-financial parameters. The parameters for evaluation of performance can be discussed as physical parameters in section- I, and financial parameters in section-II. The performance of STGs in Golaghat district is analyzed as a comparison

to its counterparts in the overall state. A value chain is present encompassing production of green leaves, processing of make tea, price setting in auction and other market in development of variants which can be promoted to place it in the export market. Each activity can be considered as value point which can be related to an overall financial and non-financial metrics.

SECTION – I

4.3 PHYSICAL PERFORMANCE

Performance or ability to accomplishment should always be accompanied with efficiency and effectiveness which is a growing concern for small tea growers in Golaghat district of Assam. The small tea growers in Golaghat district is demonstrating a positive growth since 1990's but the recent trend has indicated a reason of concern to maintain this growth. Performance evaluation is necessary to undertake its correction on real time basis. An analysis of physical performance is being attempted in this part of study where the physical performance is comprised of production level, yield or productivity and acreage of the small tea growers for the period of 2010-2020.

4.3.1PRODUCTION LEVEL PERFORMANCE

Small tea grower's growth is dependent on its potential to grow and expand so that a desired level of production can be achieved. The growth cycle of small tea growers business can be viewed as per Kaplan S. Robert (1996) and Norton P. David (1996) ,where the business unit strategy has different financial objectives in the business cycle with three stages known as growth, sustain and harvest.

The growth phase normally experiences negative cash flows and non-significant current return in terms of revenue and has a very limited access to the market. During the early stage of plantation, small tea growers barely earn or could gain on return for the initial 5-7 years of plantation. The overall cost which comprises of fixed cost and variable cost doesnot ensure any form of return on capital investment. They usually starts to get a steady cash flow once they initiate its plucking operation and profit margin can be counted with an operating income. During the period of sustain, they usually try to improve their plantation with addition of more inputs to produce more with the maintenance of its plantation and in this phase, a decision is taken for possible expansion in future. After the sustain phase, in the harvest phase the small tea growers aimed at gaining on investment made in previous two phases and they try to maximize the cash flow on receivables to bring stability on working capital reserves. The strategy for growth, sustain and harvest should be combined with revenue growth

matrix, reduce the cost by bringing more productivity and utilize the assets with balanced investment.

Production level performance is closely connected with the management activity. The age of tea bush is an important component which ensures productivity and acreage or size of the tea plantation has a significant role in determining productivity. A balanced approach is necessary to maintain the productivity of tea growers apart from the labour productivity which has a distinct place in the labour intensive tea industry.

Table-4.1RESULTS ON PRODUCTION OF STGs

Items	STGs of Assam	STGs of Golaghat	Large estates of Assam	Large estates of Golaghat
CAGR	10.4	12.6	-7.2	10.8
Mean	203	29.42	439	28.37

The growth performance in CAGR for STGs in Assam and Golaghat district alongwith large estates for Assam and Golaghat district for production in the year of 2011-20 can be found as high for STGs segment in Assam and Golaghat district.The value of CAGR is negative for large estates of Assam but for the same period large estates is showing a positive growth in production in Golaghat district.

Table-4.2CUDDY-DELLA-VALLE-INSTABILTY INDEX(IX)RESULTS ON PRODUCTION LEVEL(2010-2019)

Category	CV	Adj R^2	IX
STGs of Assam	36.9	.58	23.9
STGs of Golaghat	30.31	.893	9.91
Large estates of Golaghat	6.45	-.057	6.63
Large estates of Assam	25.7	.643	15.83

The Coefficient of variation(CV) measured is high for STGs of Assam, STGs of Golaghat alongwith large estates of Assam. While CV is low for large estates. Cuddy –Della-Valle index(IX) is used to measure the instability for tea production which shows moderate instability for STGs of Assam and large estates of Assam with an IX value of 23.9 and 15.83.But for STGs of Golaghat and large estates of Assam ,it shows a low instability with an IX score of 9.91 and 6.63.

Table-4.3 OTHERRESULTS ON PRODUCTION LEVEL FOR STGs IN GOLAGHAT(2010-2019)

t	Sig(2-tailed)	SE	Results	Remark
-2.29	.052	3.07	P≥0.05	Significant

*at 5% level of significance

The result of t-test shows that production level during the period is significant.

4.3.2YIELD OR PRODUCTIVITY PERFORMANCE

Productivity or yield is generally calculated to be kilogram per hectare in the tea growing fields. Irrespective of other factor inputs such as labour input and capital utilization, the physical quantity of output in the form of green leaves is the indicator of productivity of land. Land productivity is also determined by agronomical and climate condition of tea growing region. The study conducted by Dutta et al, (2012) on the factors that determine the tea productivity has categorized to be endogenous and exogenous factors. Endogenous factors has been identified as soil conditions based on soc or soil organic carbon, ph of soil, rainfall, age of bush, temperature clonal variety, solar radiation, atmospheric humidity and day length and exogenous factors being adjusted as use of resources. In India, tea productivity was on a promising trend till 1990's in overall tea industry, but the multiple problems faced by the large tea gardens led the productivity to a lower level which is also a combined effect of risk aversion decision undertaken by large tea growers in the region. The new model of green leaf production was supplemented by the entry of small tea growers in 1990's which contained the loss of productivity by growing tea leaves with a positive growth. The performance of yield or productivity in Assam tea industry was on a declining trend due to over exploitation of land without maintaining the recommended maintenance .Das (2010) has assessed in his study that Indian tea was in a dominant position in terms of yield (1865 kg/ha) till 1997 which could be comparable only with

productivity of Kenya. The small tea grower's average yield was below the overall average yield. The low yield of small tea growers can be attributed to its growing stage where the tea bushes were tending towards maturity and after attaining maturity the productivity expected to be at optimum level. The small tea growers at the initial stage of growing did not posses knowledge of technology and about the cultivation that they had adopted.Furthermore ,it was not deep rooted in their past culture of cultivation and they were novice in regard to the manufacturing methods. On the contrary, the large tea estates with age old plantations shows flat yield rate and a further decay in production. In Assam, the prevalence of ceiling act restricts the large estates to expand towards the available land and at the same time lands that are available did not posses clean property rights.

Mishra et al,(2016) et.al;has mentioned that the locational and size wise distribution of tea gardens is found to be effecting the productivity of tea for which the study has included two terms, where one being " temporal'' pertaining to the firm and the other is "spatial" in relation to the occupying space of the tea garden. The study has suggested an optimum size of the firm which can maintain the yield with proper management. Regarding the occupying space, in the earlier days a good number of cultivated land for tea was available which inherited an ample scope of expansion with better yield. As time passes, the availability of

fertile land in large size is declining and the new cultivated land did not contain adequate level of fertility to ensure yield at the same earlier rate.

Table-4.4RESULTS (PRODUCTIVITY:2010-2019)

Items	STGs of Assam	STGs of Golaghat
CAGR	7.6	0.6*
Mean	2293	2900

***Calculated for 2010-2019**

Table-4.5 CUDDY-DELLA-VALLE INSTABILTY INDEX(IX) ON PRODUCTIVITY

Category	CV	Adj.R^2	IX
STGs of Assam	31.12	.392	24.26
STGs of Golaghat	14.93	.003	14.90

Productivity growth performance is measured shows that STGs of Assam has higher growth performance measured in CAGR which has a value of 7.6 % compared to productivity of Golaghat ,which has a CAGR of 0.6 %.The coefficient of variation shows a high value in case of STGs of Assam as compared to STGs of Golaghat . Instability index(IX) has a moderate score for STGs of Assam and low score for STGs of Golaghat.

Table- 4.6OTHER RESULTS ON PRODUCTIVITY

t	Sig	SE	Results	Remark
-.008	.994	113.65	P≥0.05	Significant

*at 5% level of significance

Result of t-test shows a significant productivity for STGs of Golaghat during the period.

4.3.3 ACREAGE PERFORMANCE OF SMALL TEA GROWERS

Small tea growers are moving in a positive direction by gaining productivity followed by more utilization of available cultivable lands. Due to this phenomenon, the composite production volume of green leaves by STGs has crossed 50 percent of total production within the Golaghat district. In Assam, from 2008 to 2018, the production per hectare is found to be growing at the rate of 0.7 percent while STGs in Golaghat is growing at 22.3 percent . Das (2010) has cited that determination of optimal size of a tea plantation is not possible. In earlier days, the production level only followed the economies of scale due to an advantageous situation of abundant supply of labour with meager wage rate which followed by a momentum to expand more. But the situation has changed drastically due to Plantation Acts, Land Revenue Ceiling Acts and other regulatory needs has slowed down the rate of expansion in terms of acreage. In view of this stagnancy of acreage of large estates, the extra supply need of green leaves is being taken care of by the tea growers multiplying in small holdings.

The Small Tea Holdings has derived more efficiency due to optimality in management .The study of Das and Das (2020) has indicated that land availability is a concern for tea industry's expansion and they are in the opinion that government should liberalize the policy on use of land for tea cultivation as land size related to farm also brings inefficiency .So, more collaborative approach is needed by farming groups with more participation from experienced growers .It has on the other hand benefited the large tea estates to reduce the cost by 50 to 60 percent. On the other hand, STGs are not burdened with organized sectors social security measures, bonus and incentive schemes. But at the same time, practice of low labour wage structure has benefited the large tea estates to become competitive

Table-4.7ACREAGE **(STGS OF ASSAM AND GOLAGHAT IS CONSIDERED)**

Item	STGs of Assam	STGs of Golaghat
CAGR	0.7	22.3
Mean	85923.25	3855.16
CV	11.41	44.14

Table-4.8 OTHER RESULTS ON ACREAGE OF STGs OF GOLAGHAT

Item	t	Sig(2-tailed)	Results	SE	Remark
Acreage	.001	0.999	P≥0.05	1285.05	Significant

***at 5% significance level**

In terms of increase in acreage ,the STGs in Golaghat is growing at a compounding rate which is much higher than the STGs acreage in Assam.The results from the coefficient of variation shows that STGs of Assam has a Coefficient of Variation is 11.41 and STGs of Golaghat has a Coefficient of variation is 44.24.

The result shows that the acreage growth of STGs in Golaghat is significant.

4.4 PERFORMANCE IN TERMS OF LABOUR PRODUCTIVITY

Labour productivity in small tea growers is systemic which means that decision of its productivity is more of collective expectation rather than their individual needs. The labour cost arises in the form of factor remuneration for small tea growers which has close relation to the large tea estates decision on its labour wages. At the same time, the small tea grower in Golaghat district is unorganized by nature which do not have direct obligation towards the labour and plantation acts. The labour which works in the STGs are drawn from the surplus labour pool originated from the large tea estates. The other form of labourers which is relatively small in size are accessed from the nearby villages and the rest of the manual work is managed by the family members. The labour which are drawn from the large estates already has inherent skills but the new form of labour originated from the newly joined farming members who has recently gained skill. The productivity of labour is almost stagnant for a

considerable period as plucking determines a greater degree of labour productivity and it is relatively affected by external factors.Sivaram(1996) has mentioned the term plucking productivity is the quantity of green leaves harvested per work day which doesnot include the component of quality.

The pruning cycle is normally stretched in between 2 to 3 years and can be extended for 4 years where plucking constitutes 50-60 percent of labour productivity or major part and the rest of the labour productivity is meant for maintenance of good performance of plucking in volume with quality is necessary. Technically, it can be called as speed with accuracy. Adherence to the quality is necessary for a better plucking management that should also be supplemented with better time management so that plant yield could be continuously maintained. Otherwise it may have a negative impact on both quality with quantity. Consistent maintenance of standard of leaf can ensure crop quality with regular plucking round. Irregular plucking round may arise due to engagement of temporary workers which should be deliberately managed with a regular plucking round.

The plucking management should consider before planning –

i. To set the standard of green leaf so that fine leaf should make a good proportion to get better price without compromising on quantity lost, which should be monitored against any fall in sale price.
ii. Make an assessment on number of labours before plucking and skiff.
iii. Intervals should be well maintained in between pruning and plucking.

4.4.1DIFFERENT STAGES OF PLUCKING ACTIVITY IN A YEAR

In practice, the plucking period during the season of a year can have different requirements assessed and stages based on days which can be viewed as follows-

1. Growth stage-(February –March)
2. Active flushing period(April –August)
3. Slower growth stage(August-October)
4. Extended growth stage(November-December)

However, growth rate of productivity is based on sunlight, rainfall, temperature and different maintenance principles of the tea gardens on pruning, plucking rounds, and based on other physical maintenance. Although rate of plucking is counted per kg per day but it has to rely on some other factors such availability of green leaves due to irregular pattern of plantation landscape, different topological and soil conditions that results in irregular productivity. The small tea growers hired labourers keeps a target to pluck more to raise the volume of green leaves to earn more income. Plucking rate in terms of daily volume is comparatively low in large estates due to protection of their wage rate through labour acts and presence of social security also causes greater absenteeism. However ,Ranasinghe(2020) has stressed on the importance on management factors vital for labour productivity are inputs such as information based on

targets, protocol of processes ,geographical and location layout, training and labour relationship that includes health and safety and workforce welfare.

4.5 DIFFERENT INDICATORS FOR LABOUR PRODUCTIVITY

Labour productivity indicators are highly inclined to the contribution made by labour in bringing the productivity through their activities of plucking and other activities pertaining to maintenance management such as spraying, pruning, drainage clearing by imparting their skill. The skill of labour is of foremost importance for bringing greater productivity which should be accompanied by speed with accuracy.

4.5.1 PLUCKING PRODUCTIVITY

The plucking productivity is calculated on the basis of man day per hectare which means man or labour used per hectare of cultivated land during a period of time .In this case ,for different stages across the year, number of men for plucking activity needed is calculated assuming the green leaves productivity to be uniform.

Table-4.9 PLUCKING PRODUCTIVITY IN MAN-DAY PER HECTARE [AGE OF THE TEA BUSH>10 YEARS]

Activity	Year	Growth stage (February – March)	Active Flushing period(April-August)	Slower Growth (August-October)	Extended period(November-December)
Plucking Productivity	2010	4	55	40	7
	2011	5	61	40	8
	2012	5	63	55	10
	2013	6	79	58	13
	2014	5	65	45	11
	2015	4	64	43	10
	2016	3	60	40	9
	2017	6	78	57	12
	2018	6	70	55	11
	2019	8	84	61	15
	CAGR	**3.8**	**3.1**	**3.1**	**3.1**

Source-Field survey
**Calculated as average*

Plucking productivity of labour has a proportionate relationship with the age of bush. The tea garden with higher concentration of young aged bush of below 3 years has lesser quantity of green leaves that can be harvested. After 5 years of maturity, a tea bush normally carries more points to pluck and a single labour can pluck a good quantity of leaves. After a tea bush reaches maturity, the number of plucking points in a tea bush can go up to 15 points which will lead to a situation to engage more labours for plucking to reach an optimal level. The density of concentrated areas that needs to be plucked has direct impact on labour productivity is proportional to the yield. The yield of tea gardens varies with the type of

pruning that are being employed such as MP-medium prune,LP-light prune, DP-Deep skiff and MS-Medium skiff, a notable factor which has an impact on labour productivity is the decision of STGs agreement on remuneration. If a STG engage labour in a daily wage mode, the maximum plucking productivity per labour per day is expected to be 40 kg, but if the same tea growers hire the labour on contract wage system based on plucking volume can have a labour productivity upto 60 kg per day per labour. It is because of the labour on contract has more target on volume to get a wage rate per kg basis. The plucking skill of a labour also has a direct impact on labour productivity which is also proportional to the yield.

Analysis of plucking productivity in man-day is being considered for four different stages in a season starting from February till November in a year. The stages are growth stage where plucking is nominally done, active flushing period stage where the possibility of plucking productivity is reasonably higher ,slower growth stage where plucking productivity is slightly lower than active flushing period and extended growth stage where plucking activity is low in terms of man days.The analysis is done by taking the average plucking productivity of STGs per hectare in Golaghat district for the period of 2010-2019.The compounding growth rate (CAGR)for different stages which comprises of growth stage, active flushing period, slower growth stage and extended growth period is 3.8 percent,3.1 percent,3.1 percent and 3.1 percent.

Table-4.10ANOVA OF MANDAYDAY PLUCKING

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	**27612.675**	**3**	**9204.225**	**215.822**	**.000**
Within Groups	**1535.300**	**36**	**42.647**		
Total	**29147.975**	**39**			

Source-survey

Analysis of variance shows a significantly high variance between the groups as well as within the groups. In the table no-4.11 ,the standard deviation of man day plucking is comparatively high in case of active flushing period and slower growth stage with 9.5 and 8.5 compared to the growth stage and extended growth stage with standard deviation of 1.3 and 2.3.

The higher variance in case of active flushing period and slower growth stage is due to the seasonal trends and various prominent factors which determines productivity.

It is observed that for the period of 2010-2019,the year 2013.2017,2018 and 1019 has plucking productivity above mean in case of growth stage, for active flushing period the year 2013,2017,2018 and 2019 has plucking productivity above mean, for slower growth the plucking productivity is above mean for the years 2012,2013,2017,2018 and 2019 and extended growth period has plucking productivity above mean for the years 2012, 2013, 2014, 2015, 2017,2018 and 2019.

Table- 4.11 DESCRIPTIVES OF MANDAY PLUCKING AT DIFFERENT STAGES

Stage	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Growth stage	10	5.2	1.39841	0.44222	4.1996	6.2004	3	8
Active flushing period	10	67.9	9.5038	3.00537	61.1014	74.6986	55	84
Slower growth stage	10	49.4	8.52708	2.6965	43.3001	55.4999	40	61
Extended growth stage	10	10.6	2.36643	0.74833	8.9072	12.2928	7	15
Total	40	33.275	27.33832	4.32257	24.5318	42.0182	3	84

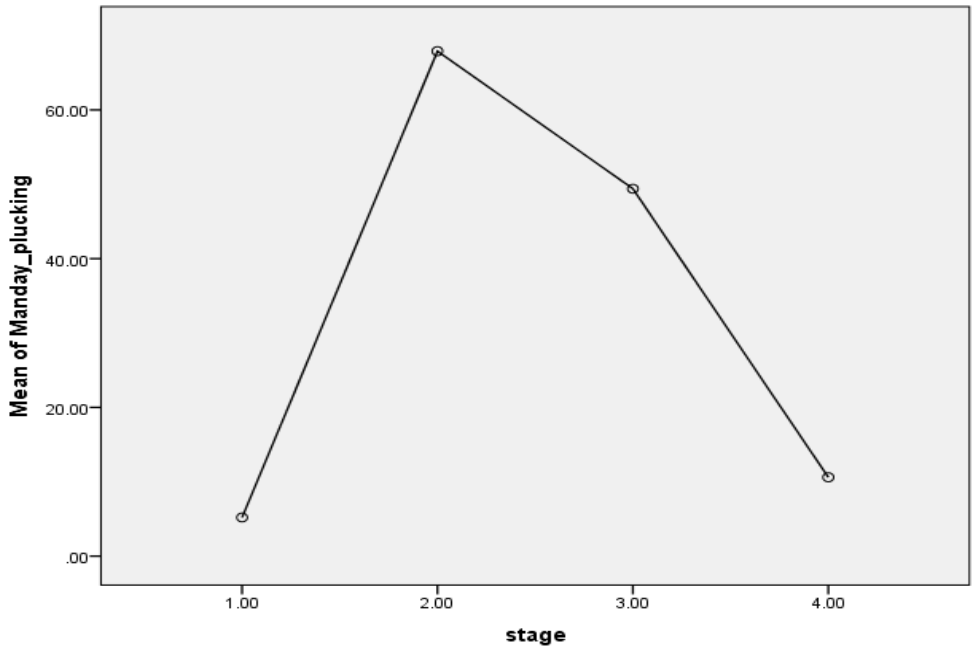
Source-survey

Table-4.12 OTHER RESULTS ON MAN DAY PLUCKING PER YEAR AGGREGATES

K-S test	t	Sig(2 tailed)	SE	P	Result
Normal	1.14	0.281	6.63	P≥0.05	Significant

*at 5% level of significance

Fig- 4.1
Mean plots



From the mean plots it could be viewed that active flushing period stage has higher mean in terms of manday plucking .

4.5.2 INPUT-OUTPUT MEASURE OF LABOUR PRODUCTIVITY

Labour productivity can be enhanced with motivational techniques such as intrinsic and extrinsic benefits, by introducing incentive schemes, training opportunities and development initiatives such as appraisal system, safety and health maintenance.

Labour productivity is the amount of contribution of labour towards production in a stipulated amount of time. Although labour productivity is dependent on factors like agro climatic, agronomic and market demand, It

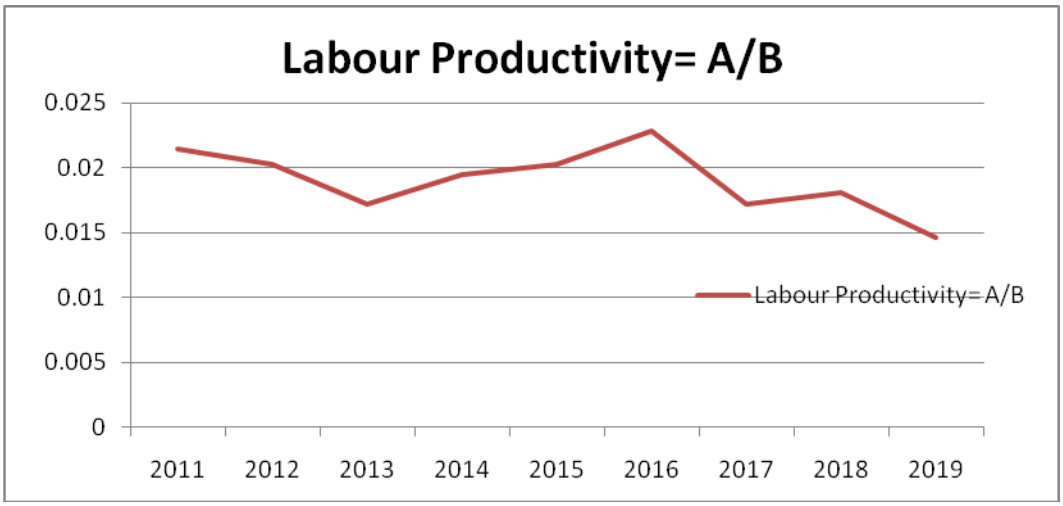
is calculated as below for the last ten(10) years assuming a regular pattern of all the factors with the application of input output ratio in terms of labour productivity.

Table-4.13 PRODUCTIVITY OF LABOUR -INPUT-OUTPUT RATIO [For Age of Plantation >10Year

Year	Labour input (No.soflabour employed)=(A)	Output (Kgs)=(B)	Labour Productivity= A/B
2011	226	10560	0.021402
2012	233	11520	0.020226
2013	237	13760	0.017224
2014	231	11891	0.019426
2015	227	11200	0.020268
2016	215	9433	0.022792
2017	240	13962	0.01719
2018	235	12986	0.018096
2019	251	17173	0.014616

Source-From Survey

Fig-4.2
Labour Productivity



Labour productivity in terms of input-output is measured by ratio of labour inputs to labour output. The low ratio of input and output of labour productivity is a positive sign for the period of 2011-2019

SECTION –II

4.6 FINANCIAL PERFORMANCE

Financial performance of small tea growers is concerned with the optimal utlisation of funds as well as formation of it. The source of fund has a dimension connected with its effective utilisation as the inefficiency in any one of them can dampen the overall financial performance. The financial performance of the small tea growers has an important place for strategic business decision in case of expansion, diversification or to make an exit from the business. The growth and sustainability of small tea growers is strongly adhered to the financial performance. The objective of financial performance of small tea growers or marginal tea growers are limited to the profitability and retention of liquidity and which assures assurance of formation of working capital for the next operating cycle. The source of finance is limited as the statutory positions of small tea growers make them ineligible for loans or chances of getting loan is rare. The credit facility of the small tea growers is dependent on the advance money provided by the collection agents and processing factories. The liquidity need of the small tea growers is fulfilled by the weekly sale of green leaves and hence profitability is declined if price of the green leaves fall below a

threshold level of price where the cover up of cost is not possible. A better financial performance is desirable with a balance between liquidity and profitability.

4.6.1 FINANCIAL RESOURCE ALLOCATION AT DIFFERENT LEVELS OF PRODUCTION

Most of the small tea growers stand as an individual proprietorship and a small proportion of them are partners in the form of share holders. The need of finance is comparatively high during the early plantation period where land purchase, preparation of land, management of systems such as plantations, drainage and other land filling management is of basic need. The cost of inputs such as fertilizer, nutrient, weedicides, labour implementation with transport and communication has a sizeable proportion of total cost. The financial gain in actual terms is achieved by the STGs only after the eighth year of the plantation. The price and cost movement determines the profitability of the small tea gardens which is discussed in the marketing scenario of the tea industry.

Financial resource allocation for the small tea has a limited option of sources.The formation of surplus fund is narrow in case of small tea growers, so the re-investment option is also less. The lower sized segment of small tea growers has more difficulty in accumulation of working capital and it is managed in time of exigency from the processing units with a predetermined price fixed on quality. As the price is fixed before a season in this arrangement, it is not remunerative for the small tea growers as the

upward trend of price in that particular season cannot bring benefit for small tea growers. The private source of finance is always carries a higher interest rate which increases the financial risk towards the small tea grower's side. The perception of financial inclusion level of the STGs with the organized financial institutions is weak and a tiny portion of small tea growers can avail credit which is almost insignificant.The Tea Board of India's financial scheme is beyond the reach of STG's in Golaghat district because of gap in administrative delivery system.

4.6.2PROFITABLITY TREND

The small tea gardens with limited land holdings cannot accumulate huge amount of money from their operation in the form of reserves out of profit earned. The STGs are hardly in a position to reinvest their profit from their resources. The declining trend in profitability due to flat price in the market with increasing cost cannot ensure retention of profit. Profitability is financial indicator for the small tea growers firm. Profitability indicates how efficiently the operation of business is being undertaken. An organization which suffers loss cannot survive in the market competition. The profit is calculated as the earnings during the operation after deducting various cost incurred.

During the survey of this study, small tea growers profit with respect to sales is given due weightage. Profitability is the indicator of efficiency of a business firm where a comparison is made in terms of value added to the

business. Ratio of Operating profit to sales is an important indicator in this regard.

4.6.2.1OPERATING PROFIT TO SALES

The relationship between the operating profits to sales verifies the managerial efficiency of a firm. This ratio is helpful for internal analysis of a firm is case of financial performance. Operating Profit to Sales in Case of STGs in Golaghat District (2015-2020)per hectare.

Table- 4.14 PROFITABILITY (OPERATING PROFIT TO SALES per ha in Rs)

Year	Operating Profit	Sales	Ratio
2012	103876	167891	0.61
2013	102235	134561	0.66
2014	110087	143456	0.66
2015	118447	169304	0.69
2016	82853	127523	0.64
2017	109216	168119	0.65
2018	102263	170960	0.59
2019	71781	119755	0.6
2020	128307	217471	0.59

Source - STGs Record book (in Avg)

4.6.3 LIQUIDITY POSITION

Liquidity position of small tea growers is important to assess their capacity to meet the short term obligation .The indicators on solvency of

the firm can be determined by commonly used liquidity ratio known as Current Ratio.

4.6.3.1 CURRENT RATIO RESULTS

A current ratio is the indicator of borrower's ability to meet any kind of current liabilities. A higher current ratio signifies that the debt can be repaid in a short period of time. The ratio in 2:1 is most suitable in case of current ratio. The current ratio is computed by dividing current assets by currents liabilities. In case of STGs, current assets are mainly comprising of cash and accounts receivables and current liabilities is account payable, short loans and advances.

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Table-4.15 CURRENT RATIO FOR STGs IN GOLAGHAT DISTRICT (per ha in Rs)

Year	Current Assets	Current Liabilities	Current Ratio
2012	172578	80000	2.15
2013	169874	80000	2.12
2014	159876	80000	1.99
2015	169304	80000	2.11
2016	127523	80000	1.59
2017	168119	75000	2.24
2018	170960	85000	2.01
2019	119755	80000	1.49
2020	217471	80000	2.71

Source-survey conducted

The current ratio of STGs for the period of 2012-2020 are in the ratio of 2:1 ,which is ideal.

4.7 MARKETING SCENARIO OF OVERALL TEA INDUSTRY

Indian tea market is huge due its size of the population and at the same time growing demand in the domestic market has led the producers to highly target its domestic consumers. The four ‘P’s of marketing in the tea industry has a strong interaction among themselves which is more commonly known as price, promotion, place and product. The basic product of the tea growers has to undergo various stages to transform into a final product or known as made tea which has a different destination after it is being promoted and placed in the ultimate market by different marketing channels. The basic raw materials or green leaf is the only product of the small tea growers as they donot posses processing units. The large tea estates has plantation crops as well as processing units and takes the responsibility to place the processed tea in a market by fixing the price. The bought leaf factories or BLFs are the standalone processing units and they donot have their own plantations and dependent on the small tea growers for the basic raw material. In the marketing supply chain of the tea industry a number of players play their role by adding value to the whole process which is reflected in the final price of the product.

Most of the macro-economic policies of the country is not reachable to the small tea growers due to their profile as an unorganized sector by character. The market information for the small tea growers is not symmetric so the pricing decision of the STG’s is not predictable. The effects of interplay of various marketing channels are beyond the reach of

the small tea growers. STGs responsibility of placing their product is limited till it reaches the hands of collective agents at an agreeable price. The unorganized nature of the STGs market does not possess adequate bargaining power which could have been helpful in demanding an expected market price.

Fig-4.3

Tea Market

Flow chart diagram of Tea Market

Source-Drawn by Author

The pathway of small tea growers product movement after undergoing various processing needs can be visualized with the aid of a

flow diagram as shown above. Small tea growers basically produce green tea leaves and their first intention is to sell their product in the market at proximity. The price negotiation of the green leaves is usually practiced with the collection agents on the spot market or some of the small tea growers take the product to the processing unit either to a bought leaf tea factory or large estate factory. In Golaghat, it is found that almost 90 percent of the tea producers settled their price through agents and hence the collection agents are mostly price fixers. Collection agents play an important role in the distribution channel where they provide services such as transportation, providing advance money and payment on the spot. So, collection agents works as a middleman to settle the trade with large estates and bought leaf factories. Once the green leaves are processed, it has to pass through auction market and direct selling market which eventually promoted and placed in domestic and foreign market with different variants.

4.7.1 ISSUES RELATING TO THE PRICING PERFORMANCE OF STGs PRODUCT

The pricing mechanism of STGs product is based on the expected price and actual realization of price.The production level is connected to the price gained in the market which ensures profitability. The organizational set up of STGs is relatively weak to place a collective demand for right price.The decision of the collection agent is not favourable in fixing prices of the STGs product. Absence of marketing

skills make the STGs to receive a threshold price and quality issues of plucking fine leaves has an added impact. However, government has experimented with different pricing formulas time to time such as price stabilization fund(PSF),application of price tagging formula and minimum benchmark price(MBP). Under the price stabilization fund ,government added relief to the STGs account in different phases of economy such as boom,normal and distress.A PSF trust was generated which would contribute Rs.1000/=(Rupees one thousand only),during a distress period member has to contribute Rs.1000/=(Rupees one thousand only)during a distress period and Rs.500/=(Rupees five hundred only)needed to contribute in a normal period.The decision was taken based on a "price spectrum band" which was fixed and announced every year. Tagging of BLFs and STGs was encouraged to sell the STGs product to their respective BLFs and finally it was sent to the auction market with a 100 percent disclosure. Minimum Benchmark Price (MBP) was another method which was applied to fix a price on the previous months auction rate to respective tea production.Moreover,under the TMCO(Tea Marketing and Control Order) 2003 regime.A district committee for pricing was established to set a minimum price for the STGs product.

4.7.2 AN ACCOUNT OF MARKET PRICE MOVEMENT OF TEA

Small Tea growers green leaves are processed in different processing units which is then carried to different markets such as auction

market and direct selling market. The Tea Board of India has the responsibility of disclosing the weighted average auction price which is mostly constitutes CTC (Cut, Tear, Curl) form of processed tea ,In Golaghat district, it is found that 75 percent of the made tea is sold through the auction market at Guwahati Tea Auction Centre and the rest of the 5 percent of processed tea is sold in Kolkata Tea Auction Centre and 20 percent is sold through direct sales. The bought leaf tea factories prefers to take the route of direct sales as they are skeptic about the price realization in the auction market which is more driven by quality. The auction market shows a secular movement where the forward contract pricing system passes through bid price.

Table-4.16 PRICE VARIATIONS IN DIFFERENT STAGES OF GROWTH IN A YEAR (PRICE in kg/ha) in slots(average days of plucking)

Year	Growth stage (Feb-March)		Active plucking period (April-August)		Slower growth (September-October)		Extended growth (November-December)	
	Price per kg	slots	Price per kg	slots	Price per kg	slots	Price per kg	slots
2011	19	9	21	40	11	14	14	4
2012	19	10	20	40	13	12	15	6
2013	18	13	18	40	12	14	10	3
2014	19	7	19	31	11	15	15	6
2015	17	8	18	27	12	13	12	5
2016	15	8	16	23	15	10	14.9	10
2017	13	10	14	33	11.5	12	12.3	9
2018	15.8	8	14	28	13.5	13	13	2
2019	13.5	8	13.8	26	14	14	12	4
CAGR	-2.3		-1		3.3		2.6	

Source-From Survey

It is viewed that from the year 2011 to 2020,the price movement of green leaves per kg shows a compounding growth of -2.3 percent for growth stage,-1 percent for the active plucking period,3.3 percent for slower growth stage and 2.6 percent for the extended growth stage.

Table-4.17ANOVA OF PRICE VARIATIONS

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	181.575	3	60.525	5.072	.005
Within Groups	429.553	36	11.932		
Total	611.128	39			

Analysis of variance shows a significant variation in prices of green leaves between groups and within groups.

Table- 4.18AVERAGE GREEN LEAVES PRICE (2011-2020)

YEAR	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Price per Kg	16.5	16	14.5	16	14.75	15.25	12.75	14	13	22

Table-4.19OTHER RESULTS ON PRICE OF GREEN TEA LEAVES

K-S test/sig	**t**	**Sig(2 tailed)**	**SE**	**P**
0.284	.044	.944	1.16	p≥0.05

*at 5% level of significance

Based on the t test and K-S normality test ,P value shows significant.

Table-4.20 MULTIPLE COMPARISON OF PRICE VARIATIONS, TUKEY HSD RESULTS

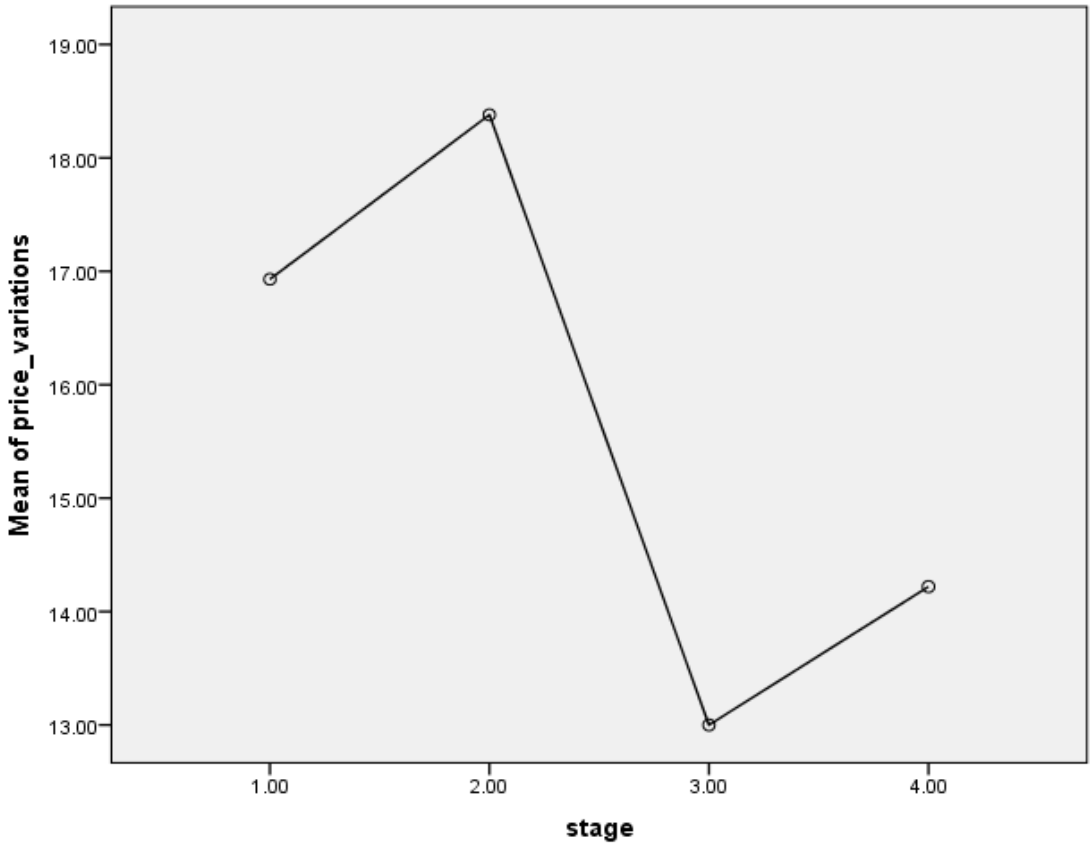
(I) stage	(J) stage	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-1.45	1.5448	0.784	-5.6105	2.7105
	3	3.93	1.5448	0.07	-0.2305	8.0905
	4	2.71	1.5448	0.312	-1.4505	6.8705
2	1	1.45	1.5448	0.784	-2.7105	5.6105
	3	5.38000*	1.5448	0.007	1.2195	9.5405
	4	4.16	1.5448	0.05	-0.0005	8.3205
3	1	-3.93	1.5448	0.07	-8.0905	0.2305
	2	-5.38000*	1.5448	0.007	-9.5405	-1.2195
	4	-1.22	1.5448	0.859	-5.3805	2.9405
4	1	-2.71	1.5448	0.312	-6.8705	1.4505
	2	-4.16	1.5448	0.05	-8.3205	0.0005
	3	1.22	1.5448	0.859	-2.9405	5.3805

*. The mean difference is significant at the 0.05 level.

Post-Hoc test for Tukeys HSD shows while taking one stage as dependent and other three being predictors for price variations for all four

stages .it is viewed that there is only significant difference in price between active plucking period and slower growth period and between extended growth period and active plucking period.

Fig-4.4
MEAN PLOTS



The mean plots is drawn to identify the price means for all four stages where in two stages namely growth stage and active flushing period has higher mean price for the period of 2011-2020.

Table-4.21 PRICE INDICES IN RELATED TEA MARKETS

Item\Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
IAP	1	0.99	1.17	1.24	1.23	1.20	1.26	1.25	1.29	1.85
GAP	1	0.96	1.16	1.17	1.23	1.22	1.21	1.24	1.32	1.23
EXP	1	1.10	1.31	1.44	1.42	1.38	1.45	1.43	1.49	1.65
STG PRI	1	1.16	1.41	1.16	1.41	1.25	1.33	1.08	1.16	1.12
Geometric average of price relative	1	1.04	1.25	1.24	1.31	1.25	1.30	1.24	1.30	1.43
Jevon's Index	100	104	125	124	131	125	130	124	130	143
Arithmetic average of price relative	1	1.05	1.26	1.25	1.32	1.25	1.31	1.25	1.31	1.48
Carli Index	100	105	126	125	132	125	131	125	131	148

The price movements of tea across different markets in different forms ranging from green leaf to the made tea can be interpreted with Jevon's price index and Carli's price index. The year 2010 is taken as base year whereas Jevon's index is the geometric mean and Carli's price index is the arithmetic mean of price index. It was observed from the indices table above that an increase in price of 4-5 percent for the year of 2010-2011, whereas the price had a rise of 20-30 percent from 2012-2018 as compared to the base year. A major rise in the price can be viewed in the year of 2019 shown by both the indices.

In case of green leaf price of STGs in Golaghat district(STGPRI),on observation it is seen that 2010-2011 has a 16 percent rise ,2011-2012 shows a increase by 25 percent with a decline by 25 percent in 2012-2013.Again, with an increase by 8 percent in 2015-2016 ,but a decay of 4 percent van be viewed in 2018-2019.

4.8 COST CONSIDERATIONS IN SMALL TEA GROWERS PRODUCTION ACTIVITIES

Small tea growers cost components and its variations have a direct impact on their performance. A higher cost can lower down the profitability which can ultimately effect the production decision. The cost break up of small tea growers comprises of the fixed cost accrued during the plantation period till its growth phase. The variable cost mainly arises due to operational costs during the production period of every year.

The initial stage of plantation activities are managed by small tea growers through their past savings which is mainly incurred for the growth of the baby plants till it reaches maturity at around fifth year and it is only after seventh year tea plants gives proper yield to touch the breakeven point at around tenth year. The cost of producing green leaves could be operation cost, materials costs and other non-recurring costs for annual maintenance. The input cost for the tea gardens is on a sharp increasing trend which is a major concern for the STGs which adversely effects the operating cycle. At the same time, it can distress the working capital formation which can create difficulty to manage other costs. Operational

cost of the industry is a major challenge for the tea industry in India and Srilanka. The tea industry is labour intensive and a higher labour cost can have a negative impact on production and revenue. The infrastructural disadvantage due to power shortage with increase in per unit cost can lead to fix a lower green leaf price. The status of the tea industry is always a price taker; hence they cannot shift the increased cost to the consumer which eventually lowers operational profitability.

Table-4.22 PERFORMANCE IN TERMS OF COST AND RETURN-COST TO OPERATING PROFIT RATIO

YEAR	COST	OPERATING PROFIT	RATIO
2012	59982	103562	0.579189
2013	66876	112760	0.593083
2014	56998	127864	0.445771
2015	67721.6	11844	0.571746
2016	51009.2	82853	0.615659
2017	67247.6	109216	0.61573
2018	68384	102263	0.668707
2019	47902	71781	0.667335
2020	86988.4	128307	0.677971

It is found that cost to operating profit ratio is mostly around 0.5-0.6 which is favourable for a farm to operate.

4.9 IMPORTANCE OF VALUE CHAIN ANALYSIS IN TEA INDUSTRY

4.9.1 INTRODUCTION

Value chain of the product is associated with the transformation of the product by adding value so that it can derive a higher demand in the market. Value chain process is rooted to the holistic sustainability which was initiated by the South Indian Tea farmers with an introduction of degree of sustainability. The sustainability is determined with a balanced interaction between the State and the driving force. The state itself concerned with the maintenance of indicators while the driving force is the amount of pressure exerted on state to achieve the target. The aim of the value chain is to make the production practices more efficient and competitive which should have a parallel motive to restore global ecosystem.

Value chain of tea industry is dependent on the participation and interaction of different stakeholders which includes tea leaf producers, tea processors, dry tea traders, wholesalers, retailers and exporters. Value chain of the tea is a complex one which involves three main activities-

- Production of tea leaves.
- Processing of tea.
- Sale of made tea. However, value chain is determined by the role of subcategories of actors and their interactions.

4.9.2DIMENSION OF VALUE CHAIN IN THE TEA INDUSTRY

Value chain analysis is getting prominence in tea industry's performance analysis to achieve competitive advantage with increasing value by reducing cost. In view of value chain developed by poster, different activities of tea industries till the final consumption of tea should be managed in such a way that could develop competitive advantage. In the process linkage should be created through active management with an aim to eliminate cost. Value chain analysis of tea industry should be conducted keeping in view of the political and socio-economic environment starting from material to reach out at final product. Bringing efficiency should be adhered so that both the producers and consumers can derive benefit.

The small tea grower's value chain of the product has a boundary upto delivery of their product to the respective processing units. Though, STGs values chain is detached from the downstream version of the product. Flow ,where a number of integration in vertical order takes place whether it is a processing unit, wholesalers and traders, retailers profit and cost input and finally reflected in the marketing margins. Value chain analysis should create an additional demand for tea in the market with raising their market share. The post plucking scenario has a grater weightage in the value chain analysis which needs more integration among the activities with higher efficiency which can have a resultant effect with benefits on STGs. **The activity flow of different stakeholders on the value chain can be visualized as:**

Fig-4.5
FAVOURABLE VALUE CHAIN

Source-Drawn by Author

4.9.3 STATUS OF STGs IN VALUE CHAIN

Small tea grower has a marginal role to play in the overall tea industries value chain but their contribution is immense in determining quality based price. STG's are confined to the business of production and supply of green leaves to the Bought Leaf Factories and factories of the large estates. STGs are ignorant about the different stages of value chain as they contribute a small part in the overall production level which completes at logistics and marketing in the whole process. STGs can gain a very small share of total gain in comparison to the gain derived by the large brokerage houses. The value addition takes place through different forms of blending packaging and other promotional techniques undertaken by the market intermediaries in the whole retail business.

Value chain analysis involves various risks and opportunities present in various transaction point. Risks can be neutralized in the tea industries with a guaranteed market reliable access to inputs, with shorter operating and marketing cycles, quality control in the form of plucking tea. The value chain of tea in the terms of transaction is found to be shorter as compared to other crops and scope of control is tighter. The problem in the tea value chain that exists is the limited opportunity of finance in case of STGs which always has a negative impact.

4.10 CASE ANALYSIS OF STGS COMPARATIVE PERFORMANCE UNDER CONTRACT PRICING

The green leaves produced by STGs is mainly marketed through the local collection agents who take the responsibility of transportation and negotiation with the BLFs and other estate factories. But there is other form of marketing based on contract price which is fixed during the beginning of season. In Golaghat district, the different forms of pricing of green leaves that can be treated as follows –

i. Market Based Pricing
ii. Contract pricing on mortgage of land.
iii. Contract pricing based on leasing

i. MARKET PRICING form of pricing is dominant and as per estimate of AASTGA, almost 80 to 90 percent of price fixation is settled through this mechanism. In this form of mechanism, the STG's take part in all day to day activities such as maintenance work of spraying pesticides and fertilizers, plucking and pruning of tea and the all involvement in this regard is being spent by cultivators. The collection agents in this system have the responsibility to carry the leaves to the factory after fixing a price as per trend in the respective markets.

ii. CONTRACT PRICING ON MORTGAGE OF LAND Mortgage of land type of contract is slightly different in technical terms from the

lease type of pricing. In this mechanism, the two parties known to be lessee and leaser come to an agreement where leaser offered the land of cultivation as the mortgage where lessee does not have a role over price fixation. Cultivated land is being legally mortgaged as compared to forward contract pricing of leasing of green leaves. The mortgage seem against the land is being offered to the lessee where the all risk of production pertaining to yield, maintenance, cost, labour management to that particular land is being taken care of by leaser. Lessee does not take into account about the green leaves as well as land and if the lessee is need of the land, he has to return the mortgage money that has been fixed. During the mortgaged period, he only gets rent of the land. This type of contract is very rare in Golaghat district area.

iii. CONTRACT PRICING BASED ON LEASING is the method of leasing of green leaves is decided by the STG's when they are in some sort of urgency. The contingencies that have been usually arises could be identified as health issue, lack of manpower, shifting to different place, need of loan which can also be a cause of aversion of growing on own. On the other hand, there is also a positive aspect of it where a number of cultivators lease their plantation area as a mode of extra income. If an individual has a fixed income such as salary or that kind of source of income, than by keeping a small tea garden ensures him an additional income.

4.10. 1THE LEASE AGREEMENT

The lease agreement which is being executed between the lessee and the lesser or owner of the tea garden.The lease agreement for STGs is embedded with responsibilities and duties of both the parties and in most of the cases for STGs vernacular language is used for full understanding of terms which comprises of financial and non financial considerations(Zyl, Van .J,1999) It is observed that in Golaghat district, the lease agreement is drafted in vernacular allowing the lesser and the lesser to understand the full terms. The lease period is normally fixed to be a year which starts from the January in a calendar year till the next year and in some cases it is extended to 3 years. The lesser pays an amount as rental for the lease period which is being agreed upon by both the parties.

The obligation of the lesser is being expressed as-

4.10.2 THE LESSEE'S PART

- The lessee will properly maintain the tea garden with delivery of all duties pertaining to maintenance of land such as clearance of drainage, spraying of weedicides, fertilizers and nutrients.
- The lessee will undertake the responsibility of plucking, pruning and collection of leaves.
- The lessee will pay the wages to the labour manage all regular and sundry costs related to the business.

- The lessee has to deal with the leaf collection agents or in case of direct agreement to the factories in fixation of green leaf price.
- The lessee has the duty to comply with the good plucking standards where fine plucking is of high priority.
- The section wise pruning whether it is upper, middle or lower in one-half or one third of tea bushes any appropriate method needs to be implemented time to time.
- The lessee will have to adhere all regulatory rules which is applicable.
- The lease agreement is not transferable and it needs to revert back to lesser if lessee decided not to continue.

The standard leasing price fixation is being done based on the Lessors demand and usually it is the prevailing rate at vicinity which determines the leasing price based on acreage or size of the firm. During the study, it is observed in Golaghat district that price per has been offered at INR70,00 per ha per year and normally a contract takes place for a year and can be renewed. If a lease duration is more than one year ,the lessor gets marginal increment on return.

4.10.3 DIFFERENCES IN PRODUCTION LEVEL AND MAINTENANCE UNDER A LEASED CONTRACT

The leased agreement is mainly offered by the lesser due to some kind of urgency occurred to them. In method and has to forego higher opportunity cost. During the lease period, the lessee are in full responsibility of the whole plantation area and it is viewed that they

followed by motive to maximize the production to earns extra profit. During the plucking, in some areas the lessee applies sickle plucking instead of hand plucking which can reduce the plucking points by causing injury. Moreover, during the lease period, the lessee uses nutrients and fertilizers to increase yield beyond the control limit which can lead to more absorption in soil which is harmful. The lessee cannot control the price which is fixed by the BLFs and collection agents. So, they can increase their profit by raising the production volume. It is seen that the production volume of lease operated tea gardens normally 10 percent higher than on an average than the owner operated tea gardens.

Table-4.23 PROFIT CALCULATION OF STGs UNDER LEASE OPERATION AND OWNERSHIP

Year	STG's under lease operation (Per ha)			STG's under ownership production (Per ha)			
	Offered contract price (per ha)	Revenue earned =price/kg * quantity	Profit earned	Price/Kg	Quantity	Revenue earned=price/kg *quantity	Profit earned
2015	75000	185878	111527	15.45	10937	169195	101517
2016	75000	140264	84158.4	15.73	8107	127523	76513
2017	75000	200823	120494	13.39	13635	182572	109543
2018	75000	199066	119440	14.27	12682	180972	108583

Source: Survey

*** : Prefixed Price**
**** : Market Price**

Table- 4.24PROFIT EARNED PER ha

YEAR	LEASED STGs	OWNED STGs	Difference in Profit
2015	111526.8	101517	10009.8
2016	84158.4	76513	7645.4
2017	120493.8	109543	10950.8
2018	119439.6	108583	10856.6
2019	149331	135753	13578

Table-4.25 RESULTS ON DIFFERENCE IN PROFIT EARNED DUE TO LEASEHOLD STGs CONTRACT PRICE AND OWNER OPERATED STGs PRICE

K-S test	t	Sig.	S.E	Result	Remark
0.949	11.14	0.000	952.23	P≤0.05	Not Significant

*at 5% level of significance

Overall result of contract price in case of lease and owners STGs is compared for profit earned using K-S normality test which has significance value of .949 . t-test was conducted having probability of significance P≤ 0.05, which means there is no significant difference in mean between lease hold pricing for STGs with profit margin derived in owner operated plantations profit margin. On the other hand, if a plantation field is given on lease ,there is higher risk of productivity loss in future due to unauthorized plucking through use of sickle and addition of non recommended use of inputs which can negatively impact soil fertility.

4.11 FACTORS RESPONSIBLE FOR PRODUCTION OF TEA IN CASE OF STGS OF GOLAGHAT DISTRICT

Factors are crucial for production of tea which determines yearly production and controls the movements of it. The role of factors in maintaining productivity of tea is multidimensional which could be exogenous as well as endogenous ranging from techniques of production, climatic condition, soil and other agricultural inputs, human resource development, interaction of marketing forces, quality consciousness, financial inclusion, role of different institutions and stakeholders, economic and other operational techniques.It is viewed that the production of tea is not affected by the technology or it is not solely dependent on endogenous factors of production but it is a composite cause of both endogenous as well as exogenous factors which can bring better or strained productivity.

The study was conducted on respondents comprising of STGs,employees of large estates and bought leaf factories in relation to the factors which determines the production of tea especially in small tea holdings.The responses are scaled by using 7-point Likert scale where 1-strongly disagree,2-mostly disagree,3-somewhat disagree,4-Neutral,5-somewhat disagree,6-mostly disagree and 7-strongly disagree.

The factors which are salient or strong in bringing productivity can result in a better performance for Small Tea Growers. Overall factors which can effect the production of tea can be summarized as below-

Table-4.26 FACTORS RESPONSIBLE FOR PRODUCTION LEVEL OF TEA

Sl. No	Factors
f1	Rainfall
f2	Temperature
f3	Fertility of soil
f4	Application of fertilizer and supplements
f5	Application of knowledge
f6	Working capital
f7	Cost of Labour
f8	Availability of Labour
f9	Skill of labour
f10	Uses of tea variety
f11	Loan facility
f12	Green leaves price
f13	Information availability
f14	Plucking and pruning
f15	Agent Grower relation
f16	Cooperation among growers
f17	Quality of green leaf
f18	Training and extension services
f19	Irrigation facility
f20	Market competition
f21	Level of education
f22	Bought leaf factory
f23	Transportation
f24	Subsidy
f25	Bonus and social security
f26	Processing technology
f27	Plantation technology
f28	Institutional role
f29	Acreage
f30	Utilisation of land

4.11.1 SUMMARY OF FACTORS IDENTIFIED FOR THE STUDY

The endogenous factors are those that are internal to the system and mainly the inputs required for the production. While the exogenous factors are those factors external to the system. Agro climatic and agronomical factors has an important role in the determination of production level of the green leaves. Agroclimatic considerations is related to the extreme climatic conditions such as dryness, flood and very hot and cold weather may bring threat to tea production and its sustainability. High on heat stress can carry forward a phenomenon of low yield for next year with alteration in leaf phenotype and lower down the net photosynthetic rate (Lie et al ,2015).The agronomical factors fertility of soil shows cultivation for a longer period depletes the soil fertility marginally which impacts the yield. In the study of Senapati et al,(2002) found that soil degradation takes place due to organic matter decay, lower cation exchange, reductions in water holding capacity, so biota missing, acidification, concentration of aluminum compaction and erosion of soil surface, nutrients degeneration with toxin formation. Applications of fertilizers and nutrients should be optimal to restore the soil practice. Wang et al,(2020) chemical fertilizer could be a primary method for continuous yield and quality but a higher usage of it leads to negative environmental impact. So, a balancing act is necessary to maintain economic and environmental benefits.Barooah et al,(2020) has viewed that

nutrients are necessary for absorption, supply and utilization of chemical substances which could induce growth and strengthen metabolic status.

Application of knowledge brings changes. Pauli et al,(2016) has emphasized in their study that collaborating with farmers, documenting their knowledge through participatory research, and presenting their views as equally important.Tea variety determines further productivity. As per Konwar(2002) and Das (2002). On the basis of the tea variety a grower can decide on whether to grow CTC or Orthodox tea. Moreover, attribute such as resistant to drought should be taken care of.Plucking and pruning in indispensable part of tea cultivation. Dutta (2002) has viewed that plucking is necessary for regeneration of shoots which may bring optimal production level and should be blended with a balance yield with quality. Pruning increases the food growth in the bush instead of contributing it to banji (unfavourable) leaves as cited by (Phukan C.B., 2002). Quality of leaves should be 2-3 leaves and a bud as per Tea Marketing Control Order(TMCO) 2003. The uneven rainfall of North East India needs irrigation facility. . Bordoloi (2002) and Goswami(2002) has given an estimate on irrigation requirement for South Bank where months of November, December needs 60mm, 50mm of irrigation to maintain soil moisture. January, February, March needs 30mm, 25mm, 30mm and month of April generally does not need any irrigation input. Moisture status is estimated through monitoring and meteorological parameter and without moisture in soil, the productivity of plant is stressed.

Financial inclusion is an important domain, working capital is required to run a business without stress. Vuckovic et al, (2017)has emphasized more on formation of permanent working capital which can support the production process in a continuous manner and ensure the condition of profitability. Small Tea Growers gap between the revenue earning and cost is narrow, which hardly strengthens the formation of working capital. Financial assistance from Tea Board of India has a pivotal role to accomplish work like maintenance, mechanization, formation of SHGs and Subsidy or support can be utilized to improve the condition. Labour inputs has cost of labour, skill of labour and availability of labour to be prioritized in the production zone. Social security measure such as bonus and incentives has a strong role to build up morale through intrinsic and extrinsic recognition.

The situation in the tea market is crucial which includes Bought leaf factories decision on price and quantity, transportation and pricing decision on green leaves. Information and knowledge base is dependent on the availability of information with a retrieval mechanism. Kuanhao (1999) has categorized the useful tea related information into agronomical field study and experiment, marketing and promotion of tea information, transfer of technology to the producers and international share of tea information whereas agronomical tea information is being disseminated among the tea growers for its scientific and technical application

Training and extension services encourage farmers to follow up useful methods with required technological adoption. Level of education also improves the capacity to visualize an Innovation. Processing Technology determines better output which finally increases the demand. Institutions bring stability and prosperity at grass root level. Akullo (2021) in his view has stated that institutional role should bring organizational arrangement with tie up of rule and routine providing guidance in behaviour of the actors towards innovation.

Land management has factors such as average which should be proportional to performance which brings uniformity. Mishra et al,(2012) has revealed that yield pattern or productivity is inversely related to the size of plantation in case of tea gardens. utilization should in tea growing area has to pass through a number of processes starting from soil testing, survey and planning of land, land clearing, land preparation, field drain employ, uprooting of land. Land utilization for tea growing should be undertaken in a manner where wastage should not take place with a concentration on high yield.

4.12.1. KAISER -MEYER –OLKIN (KMO) TEST AND BARLETT'S TEST OFSPHERICITY

KMO test is also known to measure the sample adequacy (MSA) which was tested to measure for overall and can be used for individual. KMO score can be interpreted as 0.8 or high being considered highly

significant,0.7 and above is taken to be middling,0.6 and above is mediocre and anything below 0.5 is not acceptable(Hair et al.,2006)

Table- 4.27 KMO AND BARTLETT'S TEST RESULTS

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.708
Bartlett's Test of Sphericity	Approx. Chi-Square	11811.411
	df	435
	Sig.	0.000

In this study, KMO score is 0.708 which signifies high sample adequacy and it under an acceptable range which is reflected in the table .Barlett's Test of Sphericity shows appropriate correlations among variables which enables further analysis. In this study, A good significance score for the Barlett's Test is viewed which provides a right direction for this study.

4.12.2. EIGEN VALUE AND SCREE PLOT ANALYSIS

Total variance is shown in the first 8(eight) components with Eigen values of more than 1(one) and 81.79 percent of total variance is explained by this variable. From the Scree Plot, it is prominent that till component number 8 ,the curve goes normally downward but after the 8^{th} component, it takes a sharp bend downward.

Fig-4.6

SCREE PLOT

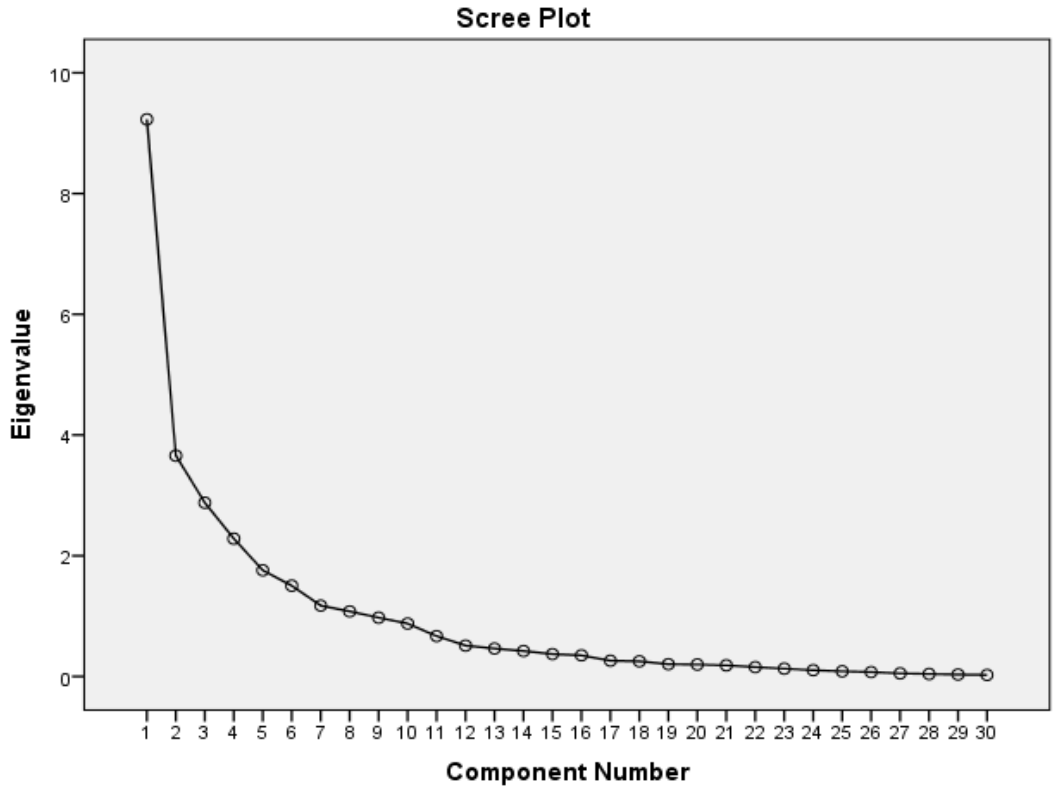


Table-4.28 EIGEN VALUES

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% ofVariance	Cumulative %	Total	% of Variance	Cumulative %	Total	%of Variance	Cumulative %
1	9.23	30.766	30.766	9.23	30.766	30.766	7.898	26.326	26.326
2	3.658	12.193	42.959	3.658	12.193	42.959	3.1	10.334	36.66
3	2.879	9.595	52.554	2.879	9.595	52.554	3.001	10.002	46.662
4	2.283	7.612	60.166	2.283	7.612	60.166	2.275	7.584	54.246
5	1.759	5.863	66.029	1.759	5.863	66.029	2.166	7.22	61.466
6	1.504	5.013	71.043	1.504	5.013	71.043	1.943	6.478	67.944
7	1.174	3.913	74.956	1.174	3.913	74.956	1.639	5.463	73.407
8	1.078	3.593	78.55	1.078	3.593	78.55	1.543	5.143	78.55
9	0.974	3.247	81.796						
10	0.877	2.924	84.72						
11	0.669	2.229	86.949						
12	0.512	1.706	88.655						
13	0.464	1.546	90.201						
14	0.422	1.407	91.608						
15	0.371	1.236	92.845						
16	0.35	1.165	94.01						
17	0.261	0.87	94.879						
18	0.252	0.839	95.718						
19	0.204	0.681	96.399						
20	0.199	0.662	97.061						
21	0.184	0.614	97.675						
22	0.155	0.516	98.191						
23	0.13	0.432	98.624						
24	0.104	0.347	98.971						
25	0.086	0.285	99.256						
26	0.073	0.243	99.499						
27	0.051	0.171	99.67						
28	0.041	0.137	99.807						
29	0.033	0.111	99.918						
30	0.025	0.082	100						

Extraction Method: Principal Component Analysis.

4.12.3. DESCRIPTIVE STATISTICS

In descriptive statistics ,it is identified that nineteen(19) variables has a high standard deviation of score more than one(1) and above in terms of responses. The variables which are included in the category are pesticides, working capital, cost of labour, availability of labour, skill of labour, usage of tea variety, loan facility ,green leaves price ,information availability ,irrigation facility, market competition, level of education, bought leaf factories, transportation, subsidy, bonus and social security, processing technology, plantation technology, agent growers relation and acreage has higher standard deviation with value of above 0.9.However,temperature,co-operation among growers, quality of green leaves, training and extension services, institutional role and utilization of land has higher standard deviation of 0.6-0.9.

Table-4.29 DESCRIPTIVES OF FACTORS

Descriptive Statistics			
	Mean	Std. Deviation	Analysis N
Rainfall	4.9775	.58980	400
Temperature	4.9625	.60581	400
Fertility of soil	4.7300	.56825	400
Application of fertilizers	4.7575	.56965	400
Application of knowledge	4.2550	1.08532	400
Working capital	2.8925	1.40030	400
Cost labour	3.0125	1.27137	400
Availability labor	3.0725	1.50096	400
Skill of labour	3.2850	1.65245	400
Tea variety usage	4.6100	1.06806	400
Loan facility	3.4425	1.47211	400
Green leaves price	3.8650	1.23920	400
Information availability	4.0100	1.38191	400
Plucking pruning	3.3175	1.48060	400
Agent grower relation	4.6625	.91416	400
Cooperation among growers	4.6650	.64716	400
Quality green leaves	4.4175	.81845	400
Training and extension services	4.5625	.88773	400
Irrigation facility	2.7750	1.31861	400
Market competition	2.8175	1.41924	400
Level of education	2.4975	1.12167	400
Bought leaf factory	4.5600	1.00445	400
Transportation	2.8100	1.47965	400
Subsidy	2.6300	1.32570	400
Bonus social security	2.4475	1.19617	400
Processing technology	2.3775	1.06434	400
Plantation technology	2.5375	1.19673	400
Institutional role	4.5925	.83857	400
Acreage	4.3800	.94490	400
Utilisation of land	4.4750	.63670	400

4.12.4. ROTATED COMPONENT MATRIX ANALYSIS

The first component which has a strong correlation is linked to the overall supply chain has a composition of infrastructure and inputs especially labour related which includes availability of labour , plucking and pruning , irrigation facility , market competition , education level, transportation , subsidy, bonus and social security , institutional role has values 0.611, 0.66, 0.80, 0.88, 0.81, 0.83, 0.89, 0.864, 0.864 and 0.872.The second component is the institutional role which has agent grower relation, co-operation among growers, role played by the institutions and acreage of the STGs with values 0.811,0.804,0.649 and 0.665.The third component is agronomical and agro-climatic which includes rainfall, temperature, fertility of soil, application of fertilizer with values 0.692,0.726,0.844 and 0.807.The fourth component is financial stability with working capital, labour cost with values .606 and .711.The fifth component is inherent capacity which has application of knowledge and information availability with values .704 and .639.The sixth component is scientific innovation with application of tea variety of value .770.The seventh component is supportive function which has training and extension services and BLFs with value of .856 and .574.The eighth component is price mechanism which includes green leaves price of value equal to .831.

Table-4.30 ROTATED COMPONENT MATRIX

Rotated Component Matrix[a]								
	Component							
	1	2	3	4	5	6	7	8
Rainfall			.692					
Temperature			.726					
Fertility of soil			.844					
Application of fertilisers			.807					
Application of knowledge					.704			
Working capital				.606				
cost_labour				.711	.			
availability_labor	.611							
skill_labour	.406							
teavariety_usage						.770		.
loan_facility	.411							
Green_leaves_price								.831
information_availability					.639			
plucking_pruning	.662							
agent_grower_relation		.811						
cooperation_growers		.804						
quality_green_leaves							.	
training_extension_services							.858	
irrigation_facility	.800							
Marketcompetition	.887							
Level of education	.810							
Bought leaf factory		.569					.574	
Transportation	.839							.
Subsidy	.890							
Bonus social security	.864							
Processing_technology	.864							
Plantationtechnology	.872							
Institutional role		.649						
Acreage		.685						
Utilisation of land				-.901				

CHAPTER V

PROBLEMS AND PROSPECTS

5.1 INTRODUCTION

Tea industry in Assam is crucial to the state's economy for a long time .The state of Assam has no suitable alternative to tea cultivation as it is being considered as most popular cash crop. But the dynamics of the tea market is changing rapidly with more value creation to raise the demand. Small tea growers at the bottom of the supply chain with a weal bargaining power. Due to supply of almost homogenous product ,the scope of additional market is absent. At the same time ,Golaghat district is showing a strong presence of small tea growers which has covered all available cultivable lands for production of tea.The phenomenon of cultivating tea in small tea holdings is highly visible in South bank districts of Sivasagar , Saraideo,Jorhat and Golaghat.

In this chapter ,the problems of the small tea growers of Golaghat district is analysed with an overview of situation of Assam.The marketing of the small tea growers in Golaghat district is still at a basic stage which is mostly confined to the sell the product to the agents .The situation of the market is becoming unfavourable day by day to the STGs due to low price realization with rising cost of the inputs. Major problems has been

discussed and prospects is being identified in this study. The main problems faced by the STGs can be identified as-

I. Systemic Problems

II. Climatic Problems

III. Marketing related Problems

IV. Production related problems

5.2. CLIMATIC PROBLEMS

5.2.1 PROBLEMS DUE TO RECENT TRENDS IN CLIMATE

Small tea growers are multiplying in a large number by causing a depletion to the forest lands, woods and greener landscape of the region.Due to this reason, an additional impact of global warming, tea production is passing through a rough phase.The climate change in the tea growing is rampant which is causing lower rainfall, reduction in soil water and unpredictable pattern of rainfall and temperature.The change of climate has an adverse effect on quality apart from the productivity of tea.

The unpredictable pattern of climate has heavy impact on temperature fluctuations or erratic rainfall.The high temperature which reduces water content of the soil and loss of moisture in the cultivated area.The weed growth also increases at an abnormal rate which has a negative impact of productivity.At the same time,extremely high rainfall increases the attack of fungal disease ,obstruction in the shoot development and decay in soil nutrients causing bud break.The extremity in the weather

condition leads to damages in plants .It is viewed that temperature and rainfall received by the tea growers is not favourable to sustain the growth.

The extremities in the rainfall causes reduction in the sunlight.The period which is known as “solar minimum “created by absence of sunshine is getting prolonged year after year has a negative impact on yield.The conducive climate of past has become a combination of drought and heavy rainfall which is hazardous to the health of tea plants.The changes in the climate led to the delay in early flushing period as well as shortening of active flushing period with a short extended growth period .This situation leads to the drop in the price of the leaves which eventually lowers the profit. The uncertainty in climate also creates interruption to the different cultural practices which determines the planting, management of young aged tea, overall management of plantation areas which includes application of fertilizer and pesticides, spraying nutrients. Plantation management is also facing a challenge, for instance the tea growers indulge in spraying fertilizer after they experience a shower in expectation that the rainfall will normalize the temperature with adequate flush of tea leaves, but in contrary it is viewed that unpredictable climatic condition creates disturbances. For instance, the tea growers indulge in spraying fertilizer after a shower in expectation that the rainfall will normalize the temperature with adequate flush of tea leaves; but the recent phenomenon of strong sunlight for a week ultimately reduces the tea leaves

production.At the same time, gaseous evaporation from the urea and other fertilizers causes damages to the upcoming buds.

Table-5.1 TEMPERATURE AND RAINFALL TRENDS IN SOUTH BANK OF ASSAM (YEAR-2008-2019)

Average Temperature in Mean of daily max(Degee C) of South Bank region of Assam

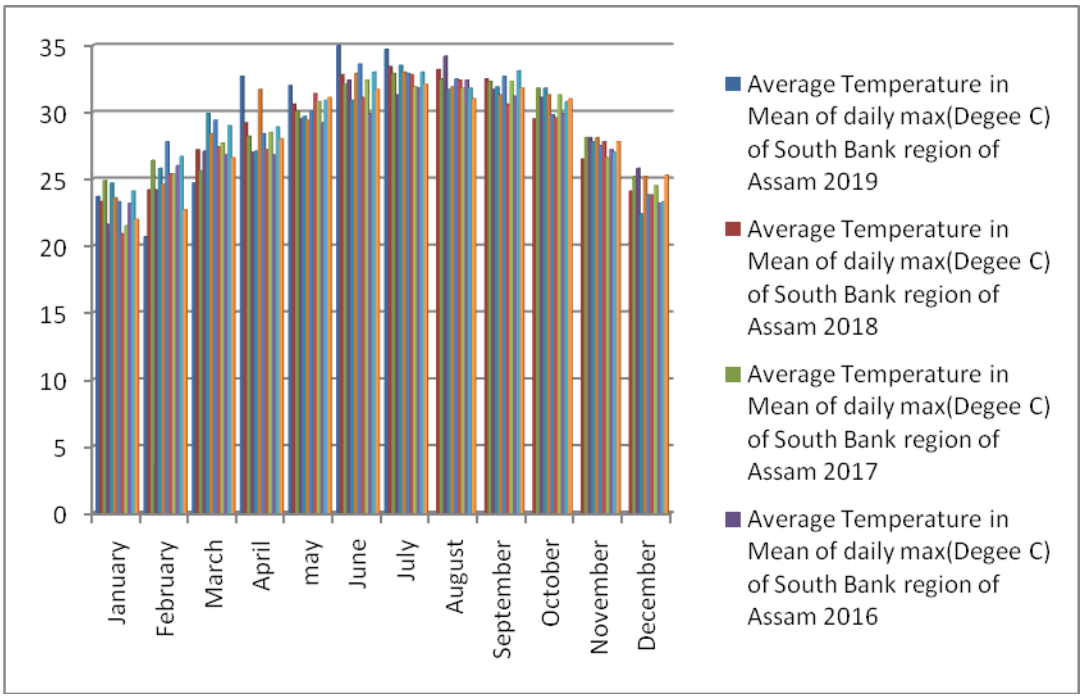
	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
January	23.7	23.3	24.9	21.6	24.7	23.6	23.3	20.9	21.5	23.2	24.1	22
February	20.7	24.2	26.4	24.2	25.8	24.6	27.8	25.4	25.4	26	26.7	22.7
March	24.7	27.2	25.6	27.1	29.9	28.4	29.4	27.4	27.7	26.8	29	26.6
April	32.7	29.2	28.2	27	27.1	31.7	28.4	27.2	28.5	26.8	28.9	28
may	32	30.6	30.1	29.5	29.7	29.4	30.1	31.4	30.8	29.2	30.9	31.1
June	35	32.8	32.1	32.4	30.9	32.9	33.6	31.1	32.4	29.9	33	31.7
July	34.7	33.4	32.9	31.3	33.5	33	32.9	32.8	31.9	31.8	33	32.1
August		33.2	32.5	34.2	31.7	31.9	32.5	32.4	31.8	32.4	31.8	31
September		32.5	32.3	31.7	31.9	31.3	32.7	30.6	32.3	31.2	33.1	31.8
October		29.5	31.8	31.1	31.8	31.3	29.8	29.6	31.3	29.9	30.8	31
November		26.5	28.1	28.1	27.8	28.1	27.5	27.8	26.6	27.2	27	27.8
December		24.1	25.2	25.8	22.4	25.2	23.8	23.8	24.5	23.2	23.3	25.3

Total rainfall in mm(2008-2018)SouthBank region of Assam

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
January	4	5.7	0	5.1	0.7	8.4	0.7	18.3	15.8	4.7	4.7	27.4
february	50	27	36.9	31.6	9.1	31.9	9.1	9	24.6	13.5	13.3	7.5
March	48.7	50	143	32.5	75.5	65.8	75.4	20.8	67.8	83.5	17.2	98.5
April	255	204	194	260	152	28.7	152	328	69.3	258	102	145.3
may	260	148	203	278	387	204	387	108	520	289	169	223.3
June	233	454.7	223	347	300	341	300	221	284	408	146	285.4
July		345.9	600	290	501	310	501	342	229	428	259	387.5
August			236	299	342	272	342	243	327	344	308	272.8
September		215.7	320	227	105	257	105	233	229	215	106	117.7
October			149	553..0	159	73.2	159	70.1	21.8	130	32.4	89.1
November			9.8	6.3	0	1	0	0.8	18.7	17.6	23.9	0
December		25.7	0	39.4	0.8	0	0.8	7.3	22.1	15.9	2.6	2

Source- **Annual Scientific Reports,TRA**

Fig-5.1 TEMPERATURE TREND OF SOUTH BANK REGION(2015-2019)



Observation from data available has shown that variations for the period 2008-2019 ,maximum temperature especially in the month of April is high in the beginning of active flushing period leads to fall in leaf production .Moreover ,precipitation in terms of rainfall has a higher fluctuations across the years for this period for active flushing period causing serious impact on yield. The observation also shows that slower growth stage also shows higher precipitation for September to November with existing temperature pattern. It donot guarantee normal production of tea.Although rainfall may slightly increase in extended growth period of November to December,fall in temperature donot support better production.

Based on climate parameters out of which two of them found to be major are temperature and rainfall has an important role in productivity which is alarming at present. It needs to be managed with sustainable measure otherwise or as per study conducted by Bhagat et al,(2016) of Tea Research Association of Tocklai Tea Research Institute, the suitability of tea growing area will shift to more elevated land(350-650 m) at Karbi Anglong and Dima Hasao in future.Hanwenyan et al,(2018) has discussed that the global mean surface temperature has been on rise from late nineteenth century and each of the decades shows a phenomenal growth of Earth temperature. A linear trend of temperature rise than that average combined land and oceanic temperature is rising over 0.85^0c from the year 1880 to 2012 as per IPCC report, 2013.The number of warmer days which is considered to be more than 35^0c is not beneficial for tea growing areas and falling humidity, lesser sunshine with fluctuating annual precipitation can strain the productivity. Over the last 100 years, the region of Northeast India known for tea cultivating is experiencing an average minimum temperature rise by 1.3^0c and Tocklai Tea Research Institute has marked a precipitation fall of 200mm in the last 96 years (Bhagat et al, 2016). A beneficial temperature of more than 10^0c which is sometimes calculated to be 15^0c can increase the tea sprouting which may lead to the extension of tea growing and plucking.Biggs et al, (2018) in their recent study on tea landscape of Assam has indicated that temperature, precipitation and extreme weather conditions could affect the world including Indian sub-

continent. Due to vulnerable weather conditions tea plantation is facing threat with a fall in the yield in quantity and quality which may create a negative impact on growers' livelihood with financial fallout. The South Bank area of Assam is facing temperature extremities ranging from 3^0c to 42^0c which has squeezed the active growing period with a combination of sunlight damage. Erratic rainfall pattern during a season may harm the production.

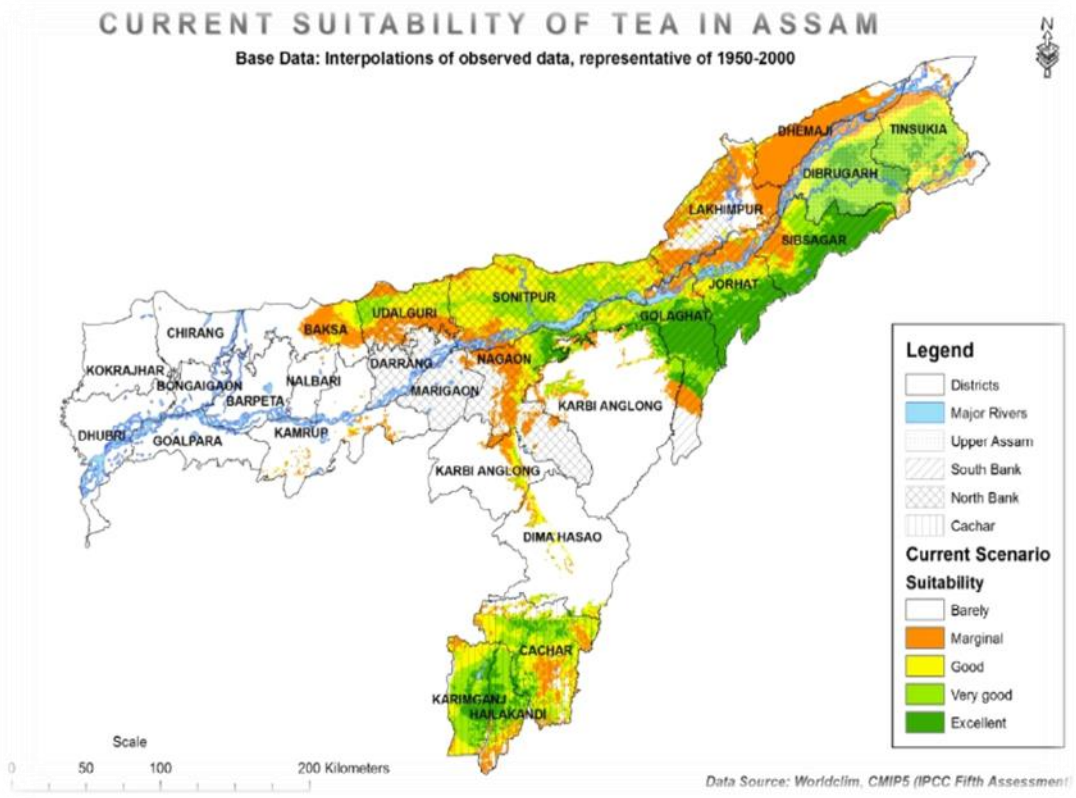
Under a moisture regime the changes in precipitation and rising temperature can cause variability in the yield of tea. Tea variety which are originated to Assam's tea known as Var. Assamica, are sensitive to the drought like situation as per observation (Duncan S.M.A et al, 2016). The variability in temperature and rainfall may affect the soil moisture which could result in heterogeneous production. At the same time commonly planted variety of tea in Assam is also not shockproof for increased monsoon. However Sonowal Supriya et al, (2018)in their study has revealed that the external environment and climatic factors (precipitation, temperature) has a strong impact on eco-physiological developments of tea plants.

5.2.2. PROBLEM OF CURRENT AND FUTURE SUITABILITY OF TEA IN ASSAM

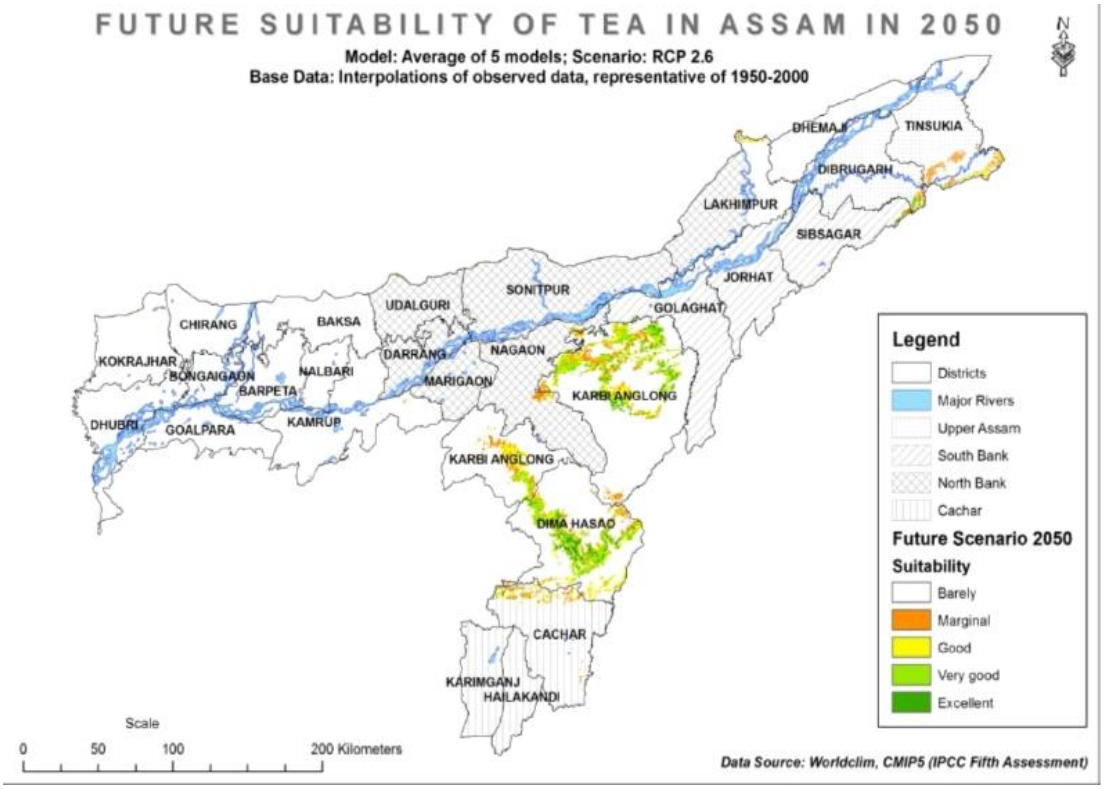
Based on the different suitability scales which can be clonal variety, management practice and type of the grower which are standard parameters with the climatic reason which can be temperature and suitable

precipitation shows that at current situation ,the four tea growing region of Assam is Upper Assam, North Bank,South Bank and Cachar is highest suitability will face abrupt change in the tea growing situation as depicted in the future suitability.

Fig5.2-Situation of tea growing in Assam



Source-Map of WorldClim,CMIPS(IPCC fifth Assessment)for 2050



Source-Map of WorldClim, CMIPS (IPCC fifth Assessment) for 2050

It shows that the prospective tea growing areas shrinks into a tiny part of Upper Assam and Cachar where average suitability will be marginally favourable with no possibility of South Bank, Cachar and North Bank.The tea growing region of Assam after 2050 can have prospects in virgin and elevated lands of Karbi anglong and Dima Hasao .

5.3 SYSTEMIC PROBLEMS

5.3.1 CHANGES IN LABOUR DEMOGRAPHIC

During the colonial period ,the tea gardens of Assam has experienced an interrupted supply of migrated labour from different parts of India mainly from Orissa,Chotanagpur area of Bihar and some parts of

Bengal.The labour pool which is known as the tea tribes was evenly distributed in the tea growing regions of Assam and also served in tea gardens atleast fifth generation.They served in the tea gardens by delivering their manual skill which is vital in the production and maintenance process.It is due to the reason that the local population of Assam was not aware of the processes of the tea gardens till 1980's.The small tea growing business has created a scope for the people at neighbourhood of the garden to participate in the cultivation process.The people of Assam was involved with the tea industry in capacities like managers and office assistants,owner of the tea gardens or into the tea broking business.

The major shortage for labour pool from the tea tribe communities occurred due to the demographic changes taking place due to rising numbers of educated youth in the tea tribes.With the introduction of SSA or Sarbha Sikhsha Abhiyan meant for the age group of 6-14 years childrens got attracted from the tea tribes.The SSA impacted in the form of expansion of elementary education alongwith institutional development ,free education materials with mid day meal with trained teachers.Tea garden was strategically clustered with decentralized education cell.The universalisation of elementary education has changed the mindset of the tea garden communities and enable them to search for new opportunities other than the tea gardens manual work.As per study conducted by Saikia et al,(2016) although teacher student ratio in the tea garden schools is below

average,the number of girl's enrollment as compared to boy's is impressive which also reduces gender gap.The particiaption of more girls also created possibility of greater income stream which changed the standard of living.

The rise in the level of education has made the tea gardens work less attractive for traditional tea garden workers due to hard work connected to this activity with lesser remuneration.In this situation ,it has become imperative for the garden workers to search for new alternative livelihood.Moreover,large estates are suffering from management and productivity problems for which they cannot offer more jobs to the new workers.The recent phenomenon of growing small entrepreneurship and job openings in service industries of cities like Bangalore,Pune,Hyderabad and Gurugram has also lured people from tea garden communities which has caused out -migration from the tea gardens.

The Shortage of labour supply is trending which has directly fuelled wage inflation.Wage inflation has an adverse effect on small tea growers which shrinks the profit and in some areas it has become more difficult to cover the cost of labour which can be viewed from the trend in the labour wage for the period of 2011-2021.

Table-5.2 WAGE TRENDS OF GOLAGHAT DISTRICT)

YEAR	PLUCKING WAGE(Rs/Kg)	MAINTENANCE DAILYWAGE (in Rs)
2011	2.5	150
2012	2.5	150
2013	2.5	150
2014	2.5	150
2015	3	200
2016	3	200
2017	3	250
2018	4	250
2019	4	300
2020	4	300
2021	5	300

Source-Survey

5.3.2. DEFICIENCY IN INFRASTRUCTURE

Infrastructural deficiency is a major concern for small holding tea growers as power shortages in factories and adverse road condition leads to loss in the tea production. Although a number of factories has overcome the power shortages by installing dedicated transformer, frequent outage in peak hour is still disrupting the production process. The gas supply to the factories is also uneven which creates interruption in processing and the whole supply chain becomes distorted. The decline by the factories to purchase the green leaves creates wastages for the green leaves of the STGs.

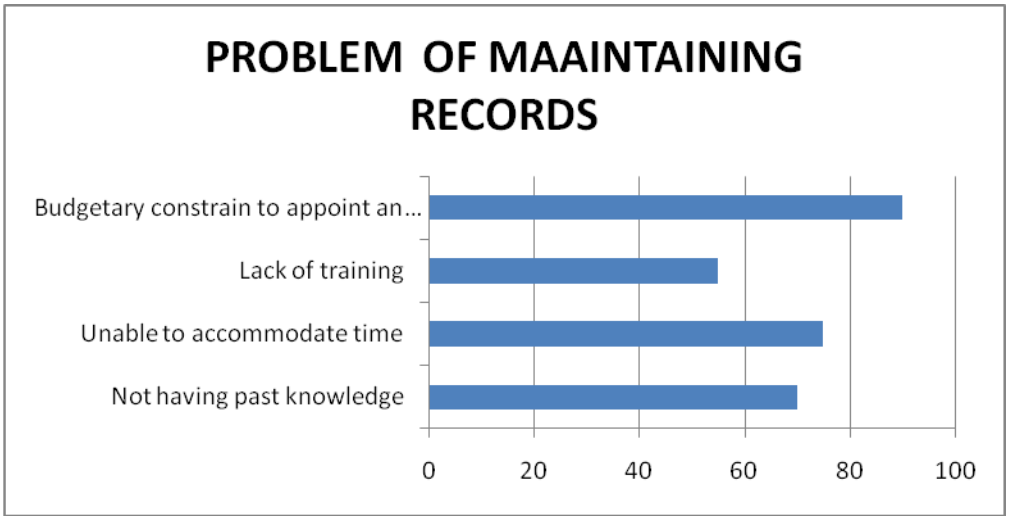
The bad road condition towards the processing units also create obstacle to the STG's green leaves to reach on time.In this situation,the small tea growers has to face the rejection of the factory owners due to dry

condition of leaves.The spatial location of bought leaf factories is a problem for the product of the STGs to cater the need of the STGs.The more concentration of BLFs has induced a gap of supply in some areas.The oversupply of leaves cannot be placed in the processing unit in the peak season and STGs has to suffer waste.The mismatch between the capacity of STGs and BLFs is a major problem and may cause entry barrier for new STGs.

5.3.3. PROBLEMS DUE TO NON MAINTENANCE OF RECORDS

STGs in Golaghat district has lesser knowledge of book keeping of records. They do not maintain their records maintain their records of day to day expenses and earnings in a standard accounting format.The literary rate among the STGs is high as 80 percent of the respondents are literate but they are not trained in the book keeping,donot have adequate resource to appoint an accountant and accommodate time to keep records.

Table5.3PROBLEM OF MAINTAINING RECORDS	
RESPONSES	**PERCENTAGE**
Not having past knowledge	70
Unable to accommodate time	75
Lack of training	55
Budgetary constrain to appoint an accountant	90



Source-From survey

It is viewed that almost 70 percent of the respondents from the Golaghat district do not possess any accounting knowledge .Most of the STGs in Golaghat district run as a sole ownership business in which every type of decision is taken by the farmers himself.In this situation, this work schedule is very hectic and they do not spare time for maintaining books for any kind of financial transaction. It is viewed that almost 75 percent of the STGs suffer from paucity of time as they have to devote more time on labour and in other farm management activities.The scenario of training for financial management is not promising as training can be helpful in minimizing cost,profit management and decide on production frontier by looking into the trend.It is viewed that almost 55 percent of respondents are equipped with training which can enable them valuation of tea gardens.Lack of proper training increases inefficiency among STGs.Most of the respondents has no access to trained accountants for a standard format of accounting and the percentage of them is 80 percent.

Due to this poor status of accounting practice ,the STGs faces a number of problem which could be inability to differentiate the garden expenses and differentiate the costs involved on labour and other costs.The mixed up of revenue and capital together creates confusion on calculating profit.It is also viewed that the record keeping in non productive season is almost absent but various activities with labour and other maintenance costs are also involved during this period.Irregular maintenance of accounts leads to profit loss which eventually creates difficulty for next productive season and finally creates strain on working capital.Non maintenance of accounts by the STGs has made them ineligible to apply for loan and other financial instituiions.Their unorganized record keeping system also prevents them to claim subsidy from the Tea Board of India.

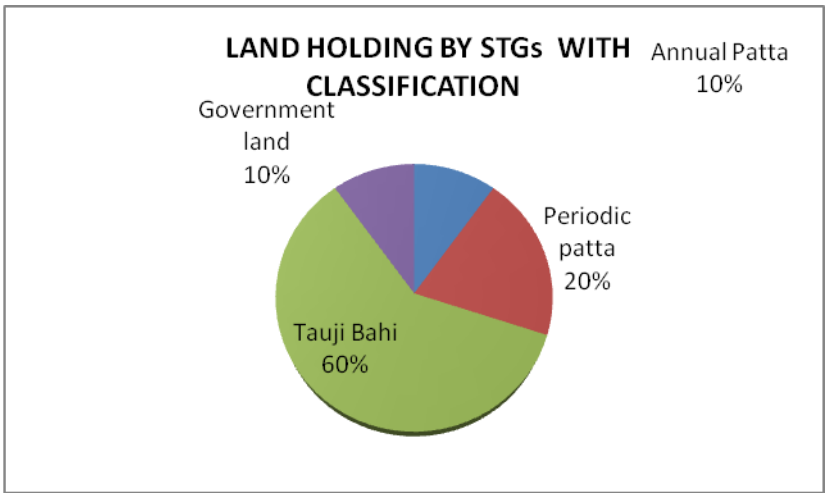
5.3.4. STATUTORY PROBLEMS DUE TO LAND DOCUMENTS

Small tea growers in the Golaghat district is touched by a major problem of inadequate legal documents.In Golaghat district,it is found that from the registration record of small tea growers from Tea Board of India ,almost 13081 of STGS are being registered which constitutes only 52 percent of total tea gardens at present.Most of the tea gardens in either in the class of Tauji Bahi land and grazing land which are purely government land.This kind is difficult to convert into a periodic land patta which has high acceptability for individual land ownership.Legally owned land is far below the total cultivated land of most of the STGs which create obstacle to

most of the tea growers to access benefit from the government.On the other hand ,the regulation of tea Board of India do not allow the STGs to register them in this form.Conversion of land to annual patta is also a complex process and STGs being in weaker position cannot complete the process.The absence of title of land also eliminate the possibility to claim subsidy and grants for interest subsidy,rejuvenation and replantationfor the STGs.The Gomari and Sarupathar blocks of Golaghat has a vast cover of forest land and a number of STGs are in operation cannot be entitled for land pattas.

Table-5.4 STGs LANDHOLDING DISTRIBUTION

LAND CLASSIFICATION OF STGS	PERCENTAGE OF LAND HOLDING
Annual Patta	10
Periodic patta	20
Tauji Bahi	60
Government land	10



Source-Survey

STGs with land ownership is very low. Most of the STGs are in lower category of land ownership but with a higher physical possession in Tauji Bahi and Government grazing land.From the sample group,it is found that 60 percent and STGs possess Tauji bahi and Government land with a combination of periodic land. It is only 20 percent and 30 percent of land which possess periodic patta and annual patta.The increase in the farm size is due to the cultivation in government land is not due to the result of purchase or inheritance.

5.4 MARKETING PROBLEMS

5.4.1. PROBLEMS DUE TO GREEN LEAF PRICING

The price of green leaf is found to be flat over the last decade from 2010-2020.A small variation in price has indicated that price is not going upward.At the same time,production cost of green leaves alongwith maintenance cost is increasing at a higher rate.

It is viewed that small tea growers as green leaf producer are price taker only,they have a very little or no influence on fixing of green leaf price.The collection agents and BLFs are taking the advantage of the situation as STGS are highly dependent on the.Tea Board of India has experimented various pricing formulas but in reality,it was not beneficial for STGs.TMCO or Tea Marketing Control Order 2003 has stressed on different measures but it couldnot bring actual gain to STGs.The district committee's for fixing price of green leaves also has a weak control over

the market.The Tea Board of India has introduced different pricing formulas mainly Price Stablizsation Formula(PSF),Price Tagging Formula and Minimum Benchmark Price(MBP).But all those formulas are found to be ineffective in controlling green leaf price in relation to the market trend.The role of tea board of India's reporting is weak in terms of bringing real profit to the growers in gaining price.The gain in final market or value added finished product is huge as compared to the gain received by STGs.STGs suffering from information asymmetry of prices has compelled them to settle the price at an extremely low margin.Sometimes,prevalence of low price is a demotivating factor for the STGs and a number of STGs are thriving to manage their cost has decided to exit from the industry.

5.4.2. LEADERSHIP PROBLEM FOR TRANSFORMATION

The unorganized nature of farming institution such as STGs lacks confidence to transform into a processing unit .Under " the cess utilisation (amendment)policy'',2015.In Golaghat district,the number of self help groups that are active in operation is three in numbers with a 439 number of STGs.The number of STGs under a SHG umbrella in Golaghat district is calculated to be only 1 percentwhich is considerably small in size.Due to this lack in numbers ,the collection agents has a dominant role in the marketing channel as well as in fixing price of the green leaves.

Transformational leadership problem among the STGs is a hindrance to the setting up of cooperative bought leaf factories in Golaghat

district.The special assistance to SHGs is offered for establishment of orthodox bought leaf factories and assistance of 30 percent of total investment for setting up of CTC factory which is not utilized by any SHGs in Golaghat district.Most of the SHGs are confined to the duty of transportation of leaves to the respected factories only .Moreover ,degree of information sharing and knowledge build up is extremely low among small tea growers.The style of leadership is predominantly risk aversion rather than risk taking which deters the overall community to follow a new policy.Due to this organizational behaviour,the STGs has no direct role in contribution to the value chain as they are at a distant mode from final product market and has little knowledge of price mechanism.

5.5 PRODUCTION PROBLEMS

5.5.1. PROBLEMS DUE TO COST ESCALATION

Small tea growers are greatly suffered by the operational cost which has an impact on overall production cost.The cost increase is reflected in the rise in the materials cost and labour cost.The increase in cost is reflected in the rise in the materials cost and labour cost.The small tea growing business islabour intensive by nature where the labour cost accounts for 50-55%of the total cost of production.To keep the plantation in good condition and in a better working order,it is pertinent for the tea growers to manage the burgeoning cost.The fixed cost of the plantation is the initial cost spent on maintenance of baby plants till it grows into

maturity.The other costs involved is the variable cost incurred annually from the fourth year onwards.The operational costs which is mainly irrigation,manuring,application of nutrients and plant protection materials and infilling of plants.The increasing pressure of materials costs has reduced the profitability of the plantation which can be viewed from table below-

Table- 5.5 PRICE CHANGES IN INPUTS

FERTILISER	YEAR 2010	YEAR 2020	UNIT (KG)	PERCENTAGE RISE
UREA	260	550	50	111
SINGLE SUPER PHOSPHATE	480	1000	50	108

SUPPLEMENT	YEAR 2010	YEAR 2020	UNIT(KG)	PERCENTAGE RISE
MAGNESIUM	100	220	1	120
DI-AMONIUM PHOSPHATE	800	1650	50	106
ROCK PHOSPHATE	350	500	50	42
ZINC SULPHATE	30	80	1	166
BORIC ACID	130	300	1	130
SULPHAX	80	300	1	275

PESTICIDES	YEAR 2010	YEAR2020	UNIT	PERCENTAGE RISE
QUINELPHOS	300	750	1LITRE	60
POCKET(LUPAR)	1200	2650	500 GM	120
THYMAX	1000	2200	1 KG	120
DELTA METHANE	1300	2400	1 LITRE	84

Source- Survey

The cost of expansion of tea garden area is also increasing every year due to higher establishment cost which doesnot provide any return for the first three years which is known as tea gestation period .The establishment cost includes the labour cost for preparation of landfills, plantation of saplings, application of manures, pesticides with maintenance of soil moisture which is considerably high and higher cost also create delay for the farmers to reach the break even point. A number of small tea growers in Golaghat district has reached the time where rejuvenation and replantation is highly needed which causes financial stress to the cultivators.

Table-5.6 AVERAGE COST OF GREEN LEAF PRODUCTION IN ASSAM AT COMPONENT COST

Sl no	Cost of Production/hectare	In % age of total expenditure (2019)	In % age of total expenditure (2011)	% age rise from 2011 to 2019
A	OPERATION			
1	Pruning	5	4	133%
2	Plucking	45	45	128%
3	Manuring	8	8	122%
4	Chemical weeding including materials	3	2	180%
6	Spraying of pesticides/fungicides, nutrients and growth regulators	13	12	35%
7	Maintenance –clearing of drains	5	5	122%
8	Carrying of leaves	1	1	100%
9	Transportation ,agents commission	4	4	166%
10	Bonus	5	5	50%
B	MATERIAL			
11	Manures and fertilizers	3	2	114%
12	Pesticides, Fungicides	1	1	110%
13	Growth regulators	2	1	110%
C	OTHER NON RECURRING COST INCLUSIVE OF EQUIPMENTS	5	9	50%
	Total(A+B+C)	100	100	

Source-STG's record book

The above table, shows that cost of various inputs such as fertilizers, pesticides and weedicides for the period of 2011-2019 can be

viewed in terms of the percentage rise in prices which effects the STGs production of green leaves. From the year 2011 -2019, the operation cost for pruning. plucking, manuring, chemical weeding inclusive of materials ,spraying of pesticides, maintenance, carrying of leaves ,transportation agents commission and bonus is rising at the rate of 133%, 128%, 122%, 180%,35%,122%,100%,166% and 50%..In materials cost, the cost of manures and fertilizers,pesticides and growth regulators are increasing at 114%,110% and 110% for the year from 2011-2019.Similarly,non recurring costs are increasing at the rate of 50% during the year of 2011-2019.

5.5.2. PROBLEMS DUE TO PRODUCTIVITY LOSS

Problem of productivity loss is inherent in the tea growing business.The large estates are suffering from decline in productivity due to land fertility issues with lagging in rejuvenation and replantation .The Plantation age of STGs in Golaghat is younger than the large estates which has a stimulating effect on the production level.But the rapid increase in the maintenance cost has led to the fall in the productivity in STGs in recent days.The cost of pesticides ,nutrients and fertilizers are increasing which has created constraint for STGs .Moreover,the recent climatic condition specially in Gomari and Sarupathar blocks has created frequent dry season which abruptly lowers the productivity in those region of Golaghat district.The STGs are already deficient in terms of working capital which

has a negative effect on the production level and future decision on expansion which could have contributed more growth.

The “crop loss’’ problem is also a unique situation where productivity decline takes place for STGs.The problem of crop loss may occur due to pests,insects,high temperature and rainfall inadequacy in fertility which is most common in recent days.Crop loss leads to the drop in productivity in that area which can be filled up with new plantation.But the new plantation needs to be taken as extra care as complex situation arises which needs to balance the proportion of nutrients,manures for both old and newly filled crops in the form of mixed plantation.At the same time,challenges also rise in the maintenance of dose of nutrients and fertilizers for newly filled plants in the gap space alongwith the existing matured plants around the cultivated land.

Productivity loss is also a major issue for STGs due to scarcity of labour which can also restrict the growers to a low maintenance and below optimal plucking stage which also effects the productivity for the next year.Productivity loss also occurs due to no buying of leaves decision taken by BLFs.

5.5.3. PROBLEMS RELATED TO QUALITY OF LEAVES

Small tea growers are mainly semi skilled and they are not conscious about quality of leaves.The quality of leaves I highly dependent on plucking standardswhich is popularly known as “fine plucking”.Based on fine plucking ,the price of the green leaves is fixed by the factory

owners as they want to follow a standard practice as they are tagged to different quality assesors.Non maintenance of quality leads to sell their product at a lower price. As per Tea Board of India,the minimum quality of green leaves should be maintained in weight as 65 percent should be composed of fine shoots with two or three leaves with a bud,maximum 30 percent should be soft banji and coarse leaf should not be more than 5 percent.But this type of stipulation creates problems to the STGs in a number of ways .As STGs hire labourers for plucking on contract basis and wage is fixed against the weight of the plucked leaves and in that situation,the labourers has the tendency to pluck by maximum weight .In that case ,STGs product has to face rejection by the factories or fetch lower price due to standard of green leaves which eventually creates a difficult situation for STGs to cover up their cost.It is also observed that 65 percent of fine plucking is not achievable across the season and a wide variation also takes place during a year.Although emphasis on fine plucking is drawn on the STGs but there is no control on BLFs and other factories arbitrary pricing of green leaves.The district price monitoring committees also has weaker control on pricing decision as lack of flexibility as per variations viewed in different factors has developed a threat for the small tea growers.

5.5.4. AGE OF TEA BUSH RELATED PERFORMANCE

The distribution of age of tea bushes has a significant role in productivity performance of tea gardens to bring a good degree of productivity. The tea plantation areas should be supplemented by new

plantation. It is estimated that the tea bushes can ensure productivity till the 50 years from its plantation. But in actual terms, it should be managed through rejuvenation and replantation on yearly recommended rate to maintain an upward trend in productivities. In large estates of Assam, they have presumably a sizeable number of old aged bushes which has negative impact of productivity. The agronomical parameters suggest that the nutrient level should be sufficient to hold six hundred different molecules and compounds. The growing age of the bush with year wise soil contamination caused by application of chemicals and fertilizers shorten their productive life cycle. Environmental degradation has created problems to the tea growers and due to this quality is compromised during their production period. The older aged tea bushes which is in the category of 40 years and above has concern with soil fertility, choice of clonal clusters, uses of eco friendly pesticides, shade trees ,pruning at right time and possible application of appropriate technology.

The major problem of falling productivity is due to the reason of higher concentration of old aged tea bushes is found to be chronic in case of large estates of India and Assam .Das(2010) has revealed that Tea Board of India recommended a rejuvenation and replantation of tea bushes at the rate of 2 percent per year but the tea estates in Assam is maintaining it at 0.4 percent per annum that has created a serious backlog of replantation and rejuvenation of tea bushes which has ultimately strained the level of production and posing as a potential risk factor for the large tea gardens. In

Assam ,it is estimated that large tea estates of Assam has a total backlog of old tea bush of 33356 hectares of area.

Table-5.7ESTIMATED BACKLOG OF AREA MEANT FOR REJUVENATION

year	Total Area of cultivation	Expected annual recommended (rate at 2 %)	Actual annual rate (at 0.4 percent)	Total Backlog
2011	229140	4582	910	3672
2012	233536	4670	934	3736
2013	233536	4670	934	3736
2014	232529	4650	930	3720
2015	232529	4650	930	3720
2016	232670	4653	930	3723
2017	237601	4752	950	3802
2018	232399	4647	929	3718
2019	233096	4661	932	3729
		41935	8379	33556

Source-estimated as per CAG report

As compared to the greater component of old aged bushes in large estates of Assam, the STGs in Golaghat district which has younger age plantations mostly planted during the period of 1990 s ,has a component of below tea bushed within the bracket of 30 years of age. But ,the case of Golaghat district is trending to the similar situation of higher concentration of old aged tea bushes in near future due to which it has already showing a falling productivity and the STGs need to invest a high amount to maintain a continuous production .It could be viewed that in Golaghat district ,the most of the small tea growers has attained its maturity if tea in the year of 1995 where the production of green leaves is high due to a strong presence of younger tea bushes marked with a better potential to

grow. The performance of STGs will suffer in terms of yield due to greater possibility of rise in backlog of old aged tea bush.

5.6 PROSPECTS OF SMALL TEA GROWERS

5.6.1 TRANSITION TO ORGANIC TEA

The growing agronomical,climatic and market trend has indicated that inorganic tea products will face challenge in future.The productivity of green leaves goes on declining with the age of tea bush.More application of pesticides,weedicides and manure has degraded the soil fertility .The price trend shows that in auction,the CTC tea faces difficulty to get above Rs.300 per Kg .The price trend across the year has also demonstrated that it is flat in nature.

In comparison to the inorganic tea ,organic tea can create a better demand with better price in the market.The processing of tea can be hand made which can guarantee lesser dependency on large processing units .Handmade green tea can fetch more price than the machine made organic tea. It is viewed from the latest trend in the market that price of different variant of tea as-

Table – 5.8 MARKET PRICE OF TEA VARIANTS

Variant	Price/Kg of Hand made organic(in Rs)	Price/Kgof Machine madeorganic(in Rs)
Green tea	1500	1200
Oolong tea	1500	1200
CTC	1200-500	900
Orthodox	1100	800

Source-Field Survey

Organic tea cultivation passes through a sustainable cycle as it is more eco friendly .The organic tea cultivation do not create any stress to the soil fertility as it is highly rich in its antioxidant content.organic tea is known for its wellness as it reduces health hazards from from various diseases such as diabetes ,heart diseases such as diabetes,heart disease and other ailments. As organic tea is composed of "vermicompost"cultivation ,it do not create threat to the cultivation at neighbourhood. Organic tea has certain certification which connects it to the niche segment.The scope in the niche market is always higher and has better prospect to gain.

Table-5.9ORGANIC TEA PRODUCERS OF GOLAGHAT DISTRICT

UNITS NAME	VARIANTS
JAMGURI ORGANIC	CTC,Orthodox
BHARALI'S TEA	Green tea(handmade)
CHANG'S TEA	Oolong,orthodox,Green tea,Yellow tea
ARIN'S TEA	Green tea
BOGAMATI ORGANIC	Green tea ,Black tea,Yellow tea,CTC
HATIKHULI ORGANIC	Black organic ,CTC and Orthodox

Source-Survey

5.6.2. MORE INTEGRATION WITH GLOBAL VALUE CHAIN

In the overall value chain of the tea industry,a number of players exist at different level of processes starting from production of green leaves,processing of teas,brokers for auction and sell,packers and blenders and finally distribution centres for domestic and external consumption.The

end consumers receives tea in the form of black tea (fully fermented),Oolong tea(semi fermented),herbal tea with different blend,CTC and Orthodox tea.The local producers of green leaves in Golaghat which are mainly STGs needs to create its own bargaining power s by maintaining its quality through certified recommendations.Instead of applying more inorganic components to its plants ,they need to restrict to the recommended quantity of its application.Excessive application of inorganic components leads to quality degradation and makes it less sustainable.The certification enables more vertical integration and bring more prospects.The STGs can come closer to value chain by setting yp their own processing plants by developing FPOs or Food Processing Organisation with compliance certification.

The certification of their product will be helpful to attract better price from brokers in the auction market.By creating their own variants and targeting the end consumers can increase their sale volume which can guarantee better price .Marketing strategy of their product needs to be formulated with optimality so that no waste should be created.The STGs should form a cartel arrangement in future to place their final product in the auction market with better price and faster payment.The dominant buyers in the global market such as J.Thomas,Eastern tea etc. should be at reach for the STGs so that to gain a standard price .

5.6.3 MIXED CROPPING

The STGs in Golaghat has a considerable acreage which can be utilized for cultivation of different crops simultaneously.A huge opportunity is infherent in the tea gardens of small holders which can include aromatic trees such as Citronella,Agarwood and other items such as bettle nuts,black pepper which can yield profit and can hedge against any loss incurred in the tea business. They can also start planting timber and sandalwood which has a strong market. Moreover, bamboo plantations nearby the small tea growing land in Golaghat district can increase the revenue by supplying it to the proposed bio diesel plant at Numaligarh refinery ltd.

5.6.4. ECO TOURISM

In the state of Assam, tourism industry is highly prioritized by the government .In relation to the promotion of tourism, government is providing assistance and subsidy allowance to the entrepreneurs. The small tea growers in Golaghat has a beautiful lush green landscape which can be utilized for hospitality business by following a suitable model. The Golaghat district has tourist attraction spot like Kaziranga National Park which can be an added advantage for STGs planning for eco tourism.

5.6.5 PROSPECTS OF MINI FACTORIES

Small tea growers bargaining power can be elevated by setting up of mini factories .The situation of oversupply at peak season is highly

exploited by the processing units by fixing price at low and in this situation STGs do not have any option .Due to long haul ,bad road condition and longer waiting period ,STGs product has a face rejection or to sell their at lower price.The setting up of mini factories in the form of SHG with an aid from the Tea Board of India can ensure better price and streamline the flow of supply.

5.6.6. PROSPECTS OF BIOFERTLIZER PLANTS

Growing demand for organic farming is increasing the prospects of bio fertilizer. STGs can look for a high futuristic demand for bio fertilizer for the tea cultivation which can be applied to other plants can garner profit. Organic lifestyle is a popular theme now a day with wellness which can create more market for organic farming.

5.6.7. PACKAGING AND MARKETING

Small tea growers should be highly integrated to the overall supply chain of the product with an end market.The packaging and marketing has a greater prospect which can be planned through price differentiation or product differentiation with greater promotion activities like advertising ,logo development ,sound networking aand online business. STGs can participate in the training programs to enhance the skill in this regard.

CHAPTER VI

SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSIONS

6.1 INTRODUCTION

Tea industry in Assam is a dominant contributor to the states economy. This plantation sector has a pivotal role in creating livelihood to a number of household. During the colonial period, the tea industry had a huge success record and after the independence ,the large tea estates has a steady growth till 1990's.The industry is deep rooted to the culture of the state with a sizeable impact on the socio economic life of the society. Tea as a beverage has always been favourite for the drinkers for its rejuvenating quality and attributes linked to the wellness.

Small tea holdings with a land holding of 10.12 hectares have become a popular cultivation which demonstrated a phenomenal growth for the last 30 years in Golaghat district of Assam. Although STGs experimented its cultivation by overcoming the restriction of colonial era, it has become a principal source of green leaves for the processing units of the region. It could be viewed that in Golaghat district, the number of STGs was 1387 and in 2012 crossed over 25,000 in the year of 2020 as per estimates of AASTGA.Most of the large tea estates has met with the

limitations for further expansion in size due to various management reasons and they are not in a position to increase their yield .In this situation,the have set a trade off relationship in some instances which had been increasing in numbers and size.

Tea is grown in almost 50 countries of the world and India's state of Assam is in the tea growing region with all the resources available for its expansion. It is due to this region that tea production in the form of small holdings became prominent.The potential areas for tea cultivation where gap was present in the state of Assam were filled up with the cultivation under the initiatives of small tea growers. It is estimated that in Golaghat district has a covered a land acreage of 13900 hectare.The state of Assam has taken an initiative to provide land pattas to 471 STGs to the extent of 2778 bighas which is equivalent to 679.85 hectares of land. It is a fact that small tea growing has become the breeding ground of different entrepreneurs ranging from tea cultivators, marketers and suppliers in different forms.

The study was conducted on the basis of data collected by applying a multistage random sampling technique which was administered by using a structured questionnaire and interview. STGs of Golaghat districts comprises of eighth different developmental blocks are considered for in depth analysis.

6.2 MAJOR FINDINGS OF THE STUDY

6.2.1 HISTORICAL BACKGROUND

Tea is a highly accepted beverage consumed by almost all countries in the world .The colonial time had a higher involvement of production and consumption of it and the trend is still continued. Tea is discovered by Robert Bruce in North East part of Assam which was a favorite drink for the Singpho tribe.After its discovery, it received royal approval under the Lord Auckland.The growth of tea in India during the plan period was 250 percent with a higher absorption of labour. China is the world leader in the production of tea followed by India ,Srilanka and Kenya. The formation of "Indian Tea Association" has integrated the tea sector in India. During the five year plan period ,under various situations and initiatives taken by the Indian government, the tea industry is grown to be a mature industry. However, various committees formed by the government had recommended for development of tea sector.

6.2.2 SMALL TEA GROWERS IN DIFFERENT REGIONS

Small tea growers has presence in many tea producing countries mainly in India,Srilanka,Kenya,Vietnam and Indonesia which has a certain definition as per their local authority. The Golaghat district of Assam in India is at the South Bank agro climatic region which is known for tea cultivation and has a sizeable number of small tea growers.The emergence

of small tea growers in Golaghat district for the last three decades has changed the tea production landscape of the state.

In India, small tea growers can be found in the states of Tamilnadu, Karnataka, Kerala in South India. It is also found in Himachal Pradesh and West Bengal in North India and in North Eastern States of Assam, Nagaland, Mizoram ,Tripura, Arunachal Pradesh and Sikkim.

6.3 PRIMARY SURVEY FINDINGS

Respondents for the study were predominantly from the STGs from different blocks with a majority of them having basic education and literate. Among the businessman in the region who had pursuit of entrepreneurship has higher concentration in this segment. Most of the STGs are tilted towards an income level into the category of middle class.Age group distribution shows that most of them are in maturity stage of above 40 years.A higher concentration of STGs are into the category of smaller size with 0-5 ha of plantation area.Higher concentration of STGs around the bought leaf factories indicates their close relationship.Most of the STGs are showing higher affinity towards sell of green leaves through agents and the SHG formation within the district is very weak. Labour engaged in this form of cultivation is predominantly casual labour. As per age wise plantation, most of the tea bushes fall under the economic category.

6.4 MAIN FINDINGS ON SCENARIO OF TEA GROWERS OF ASSAM

Tea industry has been flourishing in Assam with a visible growth along with a few states of India such as West Bengal, Himachal Pradesh and other states of North India and the South Indian states of Tamilnadu, Kerala and Karnataka.

As per estimates of Tea Board of India of 2018, Assam has around 101850 numbers of STGs with an area of cultivation of 105291 hectares which is 99.24 percent of total tea planters of the state and 31.17 percent of total acreage in the state. In all India ,the number of STGs are 210225 with an acreage of 215886.44 hectares and 1569 number of large estates with an area of 420670.63 hectares .The percentage of STGs compared to the total numbers of tea growers in India is 99.25 percent and percentage of land acreage of STGs is 33.91 percent of total acreage in overall India. Large tea estates was dominant in production of tea till the year of 2000 and after the year of 2000,STGs rose to a leading position in numbers and production of tea .

Growth of tea production is dependent on the age of tea bushes and should have concentration of economic tea bush of age 5 to 50 years. But it is found that most of the large tea estates have over 40 percent of old tea bush and tender tea bush added by lack of rejuvenation which causes decline in production.

The growth of tea estates is also linked to the market scenario of the processed tea in the auction and direct selling market and eventually to the export market. In the five year plan period starting from the first plan period in 1951-56 till the tenth plan period in 2002-2007, the trend shows in terms of area, production, average yield, export and internal consumption with an inclining trend till the fourth plan period but it was increasing at a moderate rate showing decline only in exports while domestic consumption is showing a positive trend. India is a populous country with ever growing population with a steady demand for the tea for domestic consumption.

Large tea estates which was a major contributor till the eighth plan tend to face hurdles due to reasons such as policy implications of the government and geopolitical scenario ,prevalence of ceiling act, issues connected with labour Act of 1951 and various yield related and ecological issues.

6.4.1 FINDINGS ON PRODUCTION LEVEL OF TEA IN ASSAM AND IN GOLAGHAT DISTRICT

It is found that production level of tea for the years of 2011, 2012, 2013, 2014, 2015, 2015, 2016, 2017, 2018, 2019 and 2020 in small tea growers segment in million Kgs is148.62, 106.88, 178.98, 144.25, 139.49, 182.36,281.92, 304.1, 320.83, 224.58which shows an increasing trend with respect to the share of total production of the state as 23.76 percent,15.37 percent ,22.15 percent,23.61 percent,27.64 percent ,41.94 percent,43.97

percent,47.78 percent and 49 percent. Whereas Small tea growers production share in Assam as a percentage of total production was 23.76 percent in the year of 2011 whereas large tea estates of Assam had a production share of 76.23 percent of total production. It is found that small tea growers of Assam had 47.78 percent of production share of total production as compared to the large tea growers production share of 52.21 percent of total production in Assam .It is viewed that small tea growers production share in total tea production in Assam is in an inclining trend from 2011-2019 whereas large estates tea production in 2019 in case of Assam is showing a declining trend for the same period.

The increase in growth of production of STGs in Assam is due to the increase in numbers of STGs in the state whereas the large estates of the state has consolidated its position and stalled its expansion. This has resulted a fall in their production level as the large estates were impacted by the concentration of old tea bushes, impact caused due to bargaining power of labour ,agronomic condition and policy shift in the Tea Board of India after eighth plan period which has encouraged small tea holdings and its development. A special purpose fund for small tea growers was initiated to encourage the plantations in small holdings. The large tea estates in Assam has decided to outsource the tea leaves production from STGs to overcome their problems. Small tea growers with comparatively younger tea bushes could contribute more in terms of green leaves production and they considered this situation as an opportunity.

For the period of 2011-2020,it is found that from 2011-2015,the production of tea by small tea growers in Assam had a negative trend as compared to STGs production of Assam which was persistently showing a positive trend. In case of large estates it is viewed that, large tea estates of Assam in the period of 2011-2019 was showing a negative trend but in Golaghat district,the large tea estates is showing a marginal positive trend. The compound annual growth rate (CAGR) for the period of 2011-2019 shows a positive growth rate for STGs production of Assam to be 10.4 percent and STGs production in Golaghat district in CAGR to be 12.6 percent. The production level of large estates is negative with -7.2 percent in Assam and production level of large estates in Golaghat is positive in CAGR which is found to be 10.4 percent.

A tradeoff relation in between STGs and large estates in Assam was established to gain through a win-win position for outsourcing decision of tea leaves which is significant. But In Golaghat district, this kind of relationship is not present. In Golaghat district ,the growth of STGs is due to some other reasons including a weaker form of tradeoff .In Golaghat district, on the contrary a simultaneous growth in production level of both STGs and large estates could be viewed.

6.4.2 FINDINGS ON PRODUCTIVITY GROWTH OF STGs

Productivity which is calculated to be Kilogram per hectare has a higher variation in case of STGs in Assam and Golaghat which is due to

agro climatic and agronomic reasons accompanied by various demand functions in the market and decision taken by STGs in regard to the production.The period of 2011-2020 is showing a high variation in the productivity. Although STGs in Golaghat is composed of higher concentration of economic bushes ,the collective decision of marketing channels has a strong impact .Moreover, Golaghat district of Assam is the frontrunner in cultivating tea in small holding which started in early 1990s that has caused a sizeable concentration of comparatively old aged bush with lesser rejuvenation ,replantation and new plantations.The agronomic and field management in STGs in Golaghat district is relatively weak .An overall impact on the productivity in STGs has resulted a marginal growth of 0.6 percent during the period of 2011-2019.In comparison to that overall growth rate in CAGR for STGs in Assam is showing a positive growth of 7.6 percent which is due to the more concentration of young aged bush. The CAGR for productivity of large estates of Assam is also showing a negative growth of -7.3 percent during that period.

Lesser value of standard deviation for STGs in Golaghat shows a lower dispersion and similar results can be seen in case of large estates of Assam. However ,a higher variation in terms of standard deviation can be viewed with higher productivity for STGs in Assam.

6.4.3 FINDINGS ON ACREAGE GROWTH

The number of STGs in Golaghat district and in Assam is showing a significant acreage growth. STGs are gaining prominence as the most popular cash crop with high prestige associated with it.Moreover,it has lured more and more growers with cultivable land to adopt this format of producing tea.The growth rate of STGs in terms of acreage in Golaghat in CAGR is 22.3 percent for 2011-2019 while STGs in Assam is showing CAGR of acreage for that period is 0.7 percent.But large estates in Assam is showing a positive growth with CAGR of 0.1 percent with a high significance. The correlation result shows that growing acreage of STGs has a negative impact on the large estates in both Golaghat district and Assam.The statutory problems, labour relations and ecological reason also restricted the expansion of large estates.

6.4.4 GROWTH RELATION OF TEA TO DIFFERENT MARKETS

Consumption of tea in the home country has strong impact on demand for Indian tea while export of Indian tea is relatively small. Indian tea is characterized by higher domestic consumption but in terms of quality, it is relatively low due to presence of sizeable number of STGs catagorized under unorganized sector that contributes to the production of tea. Due to higher demand in the domestic market ,Indian tea is facing shortfall for export .However ,export of tea and domestic consumption of tea is showing

a significant growth with CAGR of 10.4 percent and 10.2 percnt.Production of tea in Assam is showing a strong relation with export and domestic consumption of tea.

6.5 SMALL TEA GROWERS IN GOLAGHAT DISTRICT AND ITS OVERALL IMPACT

Growing numbers of STGs in Golaghat has significantly changed the entrepreneurial map of the district.The adoption of business by educated youth has created a motivation in the society.It has also boosted the scenario of employment for a large number of population and consequently changed the quality of life.The increase in number of STGs has also increased the production of tea .In earlier stage,STGs relied on processing units at proximity but with growing number of STGs led to the demand for more production capacity also increased.As a result,the number of bought leaf factories also multiplied and at present,the number of BLFs in Golaghat has reached to thirty six(36) in Golaghat which has processing capacity of 111930500 Kgs of green leaves constitutes 51.55 percent of total tea production in the district.STGs growth is also linked to the significant growth of the chemical industries market such as Urea ,Single Super Phosphate ,Murate of Potash and other nutrients.

6.6 FINDINGS ON THE ROLE OF INSTITUTIONS IN CASE OF SMALL TEA GROWERS

The role of institution is important in determining performance of the small tea growers in that region. The study has found that institutes that work in the tea industry in their capacity of delivering their duties and responsibilities as an administrative structure, towards financial inclusion, contribution in the marketing activity and working as a research organization disseminating their knowledge and information among STGs.

The organic growth of an individual STG alongwith the overall growth of the organisation is dependent on the role of the institution. The Tea Board of India plays a major role as an apex body to regulate and promote the growth of the STGs by delivering their administrative services and allocation of financial resources. The Tocklai Tea Research Association works toward the implementation of scientific techniques .While self help groups, bought leaf factories and trust tea has an important role in marketing activity .Association which works in addressing problems are identified to be AASTGA or All Assam Small Tea Growers Association and NETA or North East Tea Association.

The Tea Board of India works for the development activities for the tea gardens and promote development schemes to enhance quality and grant in aid to encourage research initiatives under Tea Research Association. Moreover , Tea Growers development was undertaken by Tea

Board of India for replantation, rejuvenation and new plantations for which Tea Board India allocates fund .Although ,the allocated fund was declining from 2012-2016 which shows a reasonable increase from the year of 2019-2020.

Tea Research Association is a pioneer organization which works towards plant improvement and biotechnology, agronomy and other activities such as vermicompost manufacturing, GIS (Geographic Information System) to cover up the plantation areas of the watershed base and soil rehabilitation. A special initiative is undertaken by TRA to promote best practice in STGs tea cultivation under “Mission Qualitea”.

Bought leaf factories has a strong role in the marketing structure which follows Tea Marketing Control Order (TMCO)2003 in compliance with the quality assessors.However,BLFs are facing problem to function optimally due to supply constraints, setting of procurement limit that creates uncertainty among STGs .BLFs are also facing disadvantages to practice price differentiation ,location of its operation and in quality mismatch.

Self Help Groups or SHGs in Golaghat are formed by the STGs in the form of Food Processing Organisation (FPO)s .SHGs provide relief to the STGs by forming a corpus fund pool and save them from leaf agents discretionary role. But it is seen that only three STGs in Golaghat district

namely, East Morongi SHG,FANAP and Sanjivani SHG is active with an overall 432 STGs which covers a plantation area of 153.8 hectare.

All Assam Small Tea Growers Association (AASTGA) and NETA(North East Tea Association)are addressing the problems of the marginal farmers in terms of access to fund, price realization, promotion of organic farming and demand for the land pattas.

Trust tea works towards compliance in total and quality performance of tea industry. With the certification of Trust tea, brokers can directly purchase that helps in gaining price of tea.HACCP or Hazard Analysis and Critical Control Price covers areas of manufacturing to be free from risk and hazard.

6.6.1 PERCEPTION AND SATISFACTION OF SMALL TEA GROWERS

The level of satisfaction is dependent on the perception of small tea growers in case of institutional role. In this study four different activities are considered such as administrative structure, financial inclusion , marketing activity and information sharing. The result of Cronbach's Alpha shows that, the responses are reliable and consistent.

It is found that across the dimensions which indicate the administrative capability ,the mean value of the perception is greater than the satisfaction level. The higher mean difference means whatever

perceived by the STGs in the matter of implementation of schemes with a good communication in sharing knowledge is lagging in reality which eventually lowers the satisfaction level. For the dimension of market control function which is weak as the price for the green leaves of the STGs is not favourably fixed. Prevention of irregularities and deficiency is failing creates supply demand mismatch in the market. In control function and in prevention of irregularities, the negative correlation between perception and satisfaction level shows to be negative compared to expectations and the satisfaction is low. Perception on all six dimensions has a low dispersion than the satisfaction level which means that satisfaction level is considerably below the expectation in all dimensions.

The financial inclusion for the STGs in Golaghat district is considerably low and it has a low satisfaction level .The reason for this is the statutory position of the STGs or position of non availability of land documents. Financial support which is present is only informal by nature provided by BLFs and collection agents as advance money before the plucking season. Due to rapid price fluctuations and demand pattern, the income stream of the STGs is not regular which also creates a situation where payment of loan installments is not possible. The perception on getting interest on loan added with subsidy is high but contrary to the perception, the level of satisfaction is visibly poor.Higher negative ranks for dimensions with considerable tied responses indicates larger dispersion of satisfaction level takes the STGs to an indecisive mode.

Marketing activity is crucial for the STGs which needs quantity of green leaves should be with recommended quality. Although government is experimenting with various pricing formulas ,the result is not effective. The channel of distribution also has an important role in this respect. Regarding market opportunities ,the responses for perception and satisfaction level is very close. The relationship between the perception and satisfaction is moderate in case of efficiency of distribution channels, presence of good pricing mechanism, on contract price and role of the BLFs.But in case of auction markets role, cost of marketing and good return from market, it has a significantly low level of satisfaction. The five dimensions except the dimension on opportunities in the market is not fulfilling the expectation in the market based on perception which results in a low level of satisfaction.

On training and knowledge sharing, the responses on satisfaction level is quite close to the perception. The perception has a strong correlation in relation to the satisfaction level in terms of training and productivity, reduction in flaws, enhancement in quality, in bringing good agricultural practice and sustainability. Only for transfer of technology correlation in between them is low which is due to its difficulty in implementation in real practice. The result shows that strong perception is developed related to training which significantly ensures a good agricultural practice and more sustainability.

6.7 MAIN FINDINGS ON PERFORMANCE OF SMALL TEA GROWERS

The performance of small tea growers is connected to its value base in addition to the volume or quantity of the product. The socio-economic impact of STGs has an important place which demonstrates social welfare by bringing prosperity to the life of the people. The expansion of market with creation of demand and improvement in purchasing power is highly desirable.

Eighth five year plan (1991-95) identified small tea growers to be a necessary segment where agricultural entrepreneurial skills are utilized to achieve success. Performance of small tea growers has a direction to maintain optimal use of its capacity to deliver goods and services that can reduce waste. Performance of STGs should encourage both financial and non-financial performance so that all value points can be addressed.

6.7.1 FINDINGS ON NON FINANCIAL PERFORMANCE

Non-financial performance in this study is the measure of physical performance which can accomplish the goal with efficiency and effectiveness. The period of 2010-2020 has been considered to study the performance in terms of production level, productivity and acreage of small tea growers in Golaghat district.Production level performance is highly inclined to the tea bush which has attained maturity after 5-7 years.The

study has found that management activity has an important role in bringing better production. The small tea growers segment in Assam and Golaghat district is showing an impressive growth performance with CAGR of 10.4 percent and 12.6 percent as compared to the growth of the large estates in Golaghat and in the state of Assam which has an CAGR of 10.8 percent and – 7.2 percent.

The Cuddy-Della-Valle instability index (IX) shows that STGs of Golaghat has low instability IX score of 9.96 along with large estates of Golaghat which also has low instability score of 6.63 in comparison to that STGs of Assam and larger estates of Assam has moderate instability IX value of 23.9 and 15.83

The co-efficient of variation (CV) for STGs of Assam and Golaghat is relatively higher with value of 36.9 and 30.31 as compared to large estate of Golaghat and Assam with value of 6.45 and 25.7.

Lower instability index in case of STGs along with large estates shows a better performance in the production level. In the state of Assam, the STGs and large estates shows comparatively higher instability while large estates in Assam has a negative growth rate during the period.

The performance in production level for small tea growers in Golaghat district as well as in overall in the state of Assam is better than the production performance of large estates. However, the growth performance

of STGs in Golaghat district is better than the growth rate in the state. Similar trend for the large estates in Golaghat district can also be viewed as compared to the state of Assam.

The performance in terms of productivity which is calculated to be kilogram per hectare in the tea gardens for small tea growers in Golaghat district and Assam. The results shows that growth in productivity for STGs in Assam is 7.6 percent in CAGR which is higher than the STGs of Golaghat with 0.6 percent. Cuddy-Della-Valle instability index IX is 24.26 for STGs in Assam and 14.90 for STGs in Golaghat which shows STGs in Assam has a moderate score as compared to low score in STGs in Golaghat. Productivity growth of STGs of Assam is due to number of young matured gardens is higher in newly induced STGs in the plantation map which has higher productivity as compared to Golaghat district which is pioneer in adopting this small tea holding business with most of the tea bush was planted in 1990s which needs more field management in terms of rejuvenation and re-plantation with addition of inputs. Moreover, Golaghat district falls in the South Bank agro climatic zone which is facing adverse climatic conditions.

Acreage Performance also shows a significant growth for STGs in Golaghat district while a nominal growth for STGs in Assam and large estates in Assam.

6.7.2 PERFORMANCE IN TERMS OF LABOUR PRODUCTIVITY

Labour productivity in the STGs of Golaghat is determined by the informal collective decision of the labour pool. Most of the STGs are dependent on the surplus or additional labour of the large tea estates at the vicinity.

Plucking productivity of labour constitutes 50-60 percent of labour productivity which needs quality accompanied by speed with accuracy. The labour productivity is also dependent on period of plucking season which can be divided into four stages where growth stage starts from February to March, active flushing period from April to August, slower growth stage from August to October, Extended growth stage from November to December.

Plucking productivity is the total amount of leaves harvested in a work day. The result from the study with respect to plucking productivity of labour for the period of 2010-2019 for growth stage, active flushing period, slower growth and extended growth period for per hectare shows a significant difference in plucking performance n different stages which is also effected by variations in green leaf produced. So, the labour productivity is dependent on the production of leaves. The growth stage has a plucking mean of 5.2 kg, Active flushing period has a mean of 67.69kg , slower growth stage has a mean of 49.4kg and extended growth stage has a mean of 10.6kg with standard deviation for active flushing period is

highest at 9.50, slower growth stage has standard deviation of 8.5, extended growth stage has standard deviation of 1.3.

An ANOVA result shows that there is a significant difference in productivity between the stages and within the stages. The growth performance in plucking productivity in CAGR is found to be 3.8 percent for growth stage, 3.1 percent for active flushing period, 3.1 percent for slower growth and 3.1 percent for extended growth stage. As F result shows higher significance, while comparing the difference in plucking productivity across the stages, a significant difference in terms of variations for means in different stages could be viewed.

Input-output measure of labour productivity shows that for the period of 2011-2019 when ratio of labour employed and output gained during a year per hectare is measured. Considering the factors which determine labour productivity to be uniform, it is found that labour productivity in output terms as compared to the inputs is improving with low ratio is being maintained. The labour productivity in terms of input-output is satisfactory due to target based remuneration.

6.8 FINANCIAL PERFORMANCE OF THE SMALL TEA GROWERS

Financial performance of the small tea growers is dependent on the liquidity and profitability position of the small tea growers pertaining to the

business. The trend of price accumulated is almost stagnant which leaves the STGs with any higher gain in profit.

It is found from the operating profit to sales ratio which shows a profitability trend of average STGs in Golaghat district for the period of 2015-2020 that it is in a marginal decline. The ratio found to be 0.69:1 in the year of 2015, 0.64:1 in the year of 2016, 0.65:1 in the year 2017, 0.59:1 in the year of 2018, 0.6:1 in the year of 2019 and 0.59:1 in the year of 2020.

The liquidity position of average STGs in Golaghat district is calculated by using current ratio for a cultivation of one hectare. A current ratio of 2:1 is considered to be ideal in this regard. The trend of current ratio shows for the year 2015, 2016, 2017, 2018, 2019 and 2020 shows 2.11:1, 1.59:1, 2.24:1, 2.01:1, 1.49:1 and 2.71:1. The increase in ratio could be rise in receivables at the end of the season. The improvement in the liquidity position could be seen throughout the period though the current liabilities are only those advance money taken from the agents or factory owners. The financial performance in terms of price realization of green leaves across the season is important. Price gained in different stages which could be growth stage, active flushing period, slower growth stage and extended growth stage is considered in this study for the period 2011-2020. It is viewed that CAGR in price for growth stage is -2.3 percent, for active plucking period it is -1 percent, for slower growth stage it is 3.3 percent, for extended growth stage it is 2.6 percent. The standard deviation is highest

with a value of 4.83 per active flushing period, 3.8 for extended growth stage, 2.4 for growth stage and 1.9 for slower growth stage. Maximum price gained is Rs. 30 per Kg for active plucking period and lowest price received is Rs. 10 per Kg during the slower growth stage in the period .During the period of 2011-2020.It can be observed that slower growth stage and extended growth stage indicated a price gain.

An ANOVA result shows that there is significant difference in prices between the groups or in stages or within the stages in the period. As F-test is significant, Tuckey's HSD Post hoc Test shows that only a significant difference in mean price per Kg could be seen in active flushing period and extended growth stage.It is found that maximum price gained in the period of 2011-2020 for the green leaves per kg is maximum in active plucking period with Rs. 30 per kg followed by Rs. 24 per kg in case of extended growth stage, Rs. 20 per kg for growth stage and Rs. 17 per kg during the slower growth stage.

The study on relative price performance of tea in different markets for the period of 2010-2019 can be viewed in terms of Jevons index and Carli price index. It is found that for both indices a slight increase in price in 4-5 percent calculated for IAP or Indian Auction price, GAP or Gauhati Tea Auction price, export price or EXP and small tea growers price of Golaghat district or STGPRI . But for the period 2012-2018, the price rise was in the range of 20-30 percent. A major rise in both the indices could be

seen at 40 percent for the year of 2019.From the results of correlation matrix drawn for different markets of tea ,it is found that small tea growers price in Golaghat has a low correlation with GAP or Gauhati Tea Auction price for made tea.

Performance of STGs related to the cost considerations can be viewed with the movements in average cost of green leaves to profit ratio for the small tea growers for the period of 2011-2020.It is found that cost to operating profit is in a favourable state.

On factors determining the level of production of STGs, it is found that eight factors are having eigen values greater than 1 which also shows a cumulative variance of 81.79 percent. The eight components which are prominent are at first infrastructure and inputs, secondly institutional role, at third is agronomic and agro-climatic components, fourth factors comprises of financial stability, the fifth is inherent capacity ,sixth has component of scientific innovation, seventh component is supportive functions and eight is price mechanism.

6.9 MAJOR FINDINGS ON PROBLEMS AND PROSPECTS OF SMALL TEA GROWERS:

The growth of Small Tea Growers for the last decade is also creating challenges due to various reasons. The rising member of STGs is also making the competitiveness of the industry intense. The problems which can be a threat at present can be identified as systemic problems,

climatic problems, marketing problems and problems relating to the productivity.

Climatic problems can be mainly problems due to the recent trends in climate and shifting of suitability of tea landscape. Recent trend shows that unpredictable pattern has huge impact on temperature changes and erratic rainfall. It also changes the duration of flushing period of leaves which also adds different diseases to the plants.

On suitability of tea landscape, it is found that the present tea growing region will shrink in future with this ongoing trend of climate and the upper Assam. North Bank, South Bank and Cachar region will have little suitability of tea Growing and it will be shifted to the elevated lands of Dima Hasao and Karbi Anglong. A systemic problem is being identified as problems due to demographic changes, infrastructure inadequacy, problems due to non maintenance of records by the STGs, statutory problems of land documents. The demographic changes has induced a higher expectation of wages rate with deficient labours and deficiency in infrastructure is creating a wastage due to demand supply mismatch. STGs position of record keeping is poor which is creating a management problem to prepare any forecasted future business plan. Non availability of land documents has created a challenge to the STGs to avail the facility from the concerned authority especially it develops obstacles for financial inclusion. Marketing problem is due to the green leaf pricing mechanism and

transformational leadership problem. STGs are at a very weaker position of bargaining power or they are merely a price taker and suffering from underpayment of their product by price fixers. STGs are lagging in formation of transformational leadership as their collection voice is considerably weak. Productivity problems arises among STGs due to productivity loss caused by lack of rejuvenation and re-plantation, "Crop Loss" problem and in some region or blocks, labour is deficient in the plucking season. STGs are also facing the problems relating to the quality of tea leaves due to low practice of standard plucking. The growing concentration of old age of tea bush in the STGs field in Golaghat district is also causing a productivity fall.

Prospects in the small tea growing cultivation can be developed by making a transition to the organic tea as the organic tea has a greater demand. STGs should integrate to the "Global Value Chain" by forming their own FPO or Food Processing Organisation. The STGs can indulge in mix cropping around its cultivated land to gain more and hedge from any future loss. Eco Tourism has a better prospects for STGs in Golaghat district as the region has a number of popular tourist spots in the vicinity. The STGs can gain more by setting mini factories. STGs can take up the business of bio fertilizers which has bright prospects.The STGs can also develop and apply its skills in the packaging and marketing by setting up their own start ups.

6.10TESTING OF HYPOTHESES

The hypothesis testing is based on the results obtained in this study is being attempted in this section. The following two hypothesis are considered for testing so that further analysis can be conducted on the performance of small tea growers in Golaghat district of Assam :

H_{01} : The performance of small tea growers in Golaghat district is improving.

H_{02} : The practice of contract price is not effective for increasing profitability of small tea growers.

In order to study the performance of STGs in Golaghat district, the study has been made for Financial and non financial performance. Non financial performance is the physical performance in regard to the production level, productivity and acreage that has been considered alongwith labour productivity. The financial performance can be identified through liquidity, profitability and cost ratios alongwith gain in price of green leaves.

6.10.1 PHYSICAL PERFORMANCE

ON PRODUCTION LEVEL: The production level of Green leaves tea is maintained in Assam due to the contribution of small tea growers segment from 2011-2020.It is viewed that production of tea by STGs is growing at a compound growth rate with a visible positive trend. The young tea bushes

with lesser stress of management problems have ensured a continuous supply of green leaves from the STGs in Golaghat district. Instability index of STGs in Golaghat district is also comparatively low in case of Production Level.

Productivity of small tea growers in Golaghat district is positive during the period of 2010-2019 in terms of the compounding growth rate. The continuous productivity of green leaves in physical terms is visible due to greater concentration of economic tea bushes in the plantation area of STGs. The steady flow of green leaves is contributing to the productivity and also due to the presence of ready market accompanied by a existing demand in the Golaghat district. The agronomic and agro climatic factors were favourable for that period which ensured a positive productivity. The results on productivity in Golaghat district are also demonstrating a positive trend. The instability index calculated for productivity of small tea growers in Golaghat district also reveals a relatively stable productivity for the period. The t-score value also shows a significant result with P value greater than 0.05

The results on acreage are showing a positive compounding growth rate in case of STGs in Golaghat district. The number of STGs in Golaghat district is consistently rising during this period which also leads to the rise in the acreage rate. STGs as a motivating model increase the entrepreneurial scope. Accepting it as the most suitable cash crop for primary and alternative source of income alongwith growing number of

BLFs has increased the number of STGs and area of plantations for this period. The trend of acreage for STGs in Golaghat is positive with a higher significance of t-value with P being greater than 0.05.

Labour productivity in the tea industry is crucial for plantation, plucking of leaves and management of fields. The whole operation of STGs is highly labour intensive. The labour productivity in terms of man day plucking also shows a positive compounding growth rate with the rising production. Most of the STGs prefer to engage the labour in contractual mode where the remuneration per day is dependent on the weight on the daily plucking volume. Although the mean plucking is comparatively different in different stages of growth, the productivity in terms of man day plucking is steadily increasing. The man day plucking for the period shows a significantly high P value calculated based on t-test.

Input output measure of labour productivity which is the ratio of inputs from labour to the output received on calculation of labour contribution during a period keeping the factors being uniform. The labour productivity in terms of ratio shows rising during the period of 2011-2020 due to improvement in labour output with a fall in the ratio of input output. The output of labour is significantly higher with P value being greater than 0.05 based on t-Test.

6.10.2 FINANCIAL PERFORMANCE

Financial Performance of the small tea growers are highly dependent on the price variations in the market and other financial position such as liquidity, profitability and cost consideration.

Price variations in the green leaf market are crucial for the STGs gain. STGs are price takers and price determining forces play a major role through which gain in price can be achieved. Price per Kg of the STGs is showing a positive growth performance. Price per Kg varies across the different stages in the market for the period 2011-2020. Price index for the STGs green leaf in Golaghat is also showing a fluctuation and is slightly correlated to the Gauhati Tea Auction price. STGs price is still in a profitable position that is vital for sustainability. Price variations shows a positive performance which is highly significant with t-result having P value greater than 0.05.

The profitability ratio which is operating profit to sales is showing a steady ratio. Due to lesser variability of price and quantity of green leaves in the Golaghat district for 2011-2020. Profit gained with respect to sales is although marginal, but it is positive.

The liquidity position in terms of current ratio is also showing to be ideal with a current assets to current liability is around 2:1 for the year 2011-2020 which shows a lesser financial risk in regard to this business.

Cost consideration of STGs is important in decision making whether to continue or exit from the market. The higher trend of cost can lower down the profitability and in operation cost, the cost of input has a strong impact. It is viewed that although production cost of tea is on a rising trend, the ratio is still in a profitable range in between 0.5-0.6 for the period of 2011-2020 in comparison to cost.

The STGs performance in terms of financial or non financial or physical performance is positive across all parameter taken for study. The trend is positive despite this segment of small tea growing facing same issues. Hence "the hypothesis H_{01} **:** The performance of small tea growers in Golaghat district is improving" stands proved and accepted.

Contract price of green leaves is prevalent among those STGs those who are facing some kind of exigency. In reality STGs which are on lease agreement becomes a lessor has to sacrifice an opportunity cost. The contract price arises either against a legally mortgaged land and leased land. Mortgaged type of contract is almost absent in Golaghat district and only leased type of arrangement is present where an annual price is settled against the production of upcoming year.

In actual practice it is viewed that in leased operated gardens, the risk of loosing future yield is extremely high due to low maintenance by lessee with bad plucking practice such as use of sickles instead of hand

plucking. The usage of inputs is not as per recommended quantity which can degrade the soil fertility and chances of low yield will be high.

The result obtained from difference between the profit earned from leased garden due to contract price and profit earned on owner operated price is insignificant. The result viewed from t-test has P value lower than 0.05. Hence "the hypothesis **H_{02}** : The practice of contract price is not effective for increasing profitability of small tea gardens" which stands proved and accepted.

6.11CONCLUSION

Small tea growers are maintaining a paradigm in Golaghat district of Assam. The reason for growth of STGs in Golaghat is a movement rather than a trade off arrangement with the large tea estates. The growth of STGs in Golaghat district was rapid during the period of 1980's which has driven the organizational growth into maturity. In this recent days, STGs of Golaghat district is higher concentrated with economic bush. The small tea growers in Golaghat is in emergency need of innovation to restore its high productivity. The STGs should follow the process of rejuvenation, re-plantation and new plantation to continue in the business.

The production of large tea estates in Golaghat is growing at a positive rate. But the STGs are growing at a higher rate than the large estates which indicates a dominant position. But the productivity position of STGs in Golaghat district is not promising due to higher concentration of

old aged bush. The falling or stagnant acreage of large estates ensures an important position for STGs in tea production landscape. However, large estates do not have intention and capacity to expand due to restriction posed by unavailability of land.

In Golaghat district, STGs are showing a visible stability which could be a high positive sign for the overall performance. The yield of STGs can face problem due to agronomic factors such as utilization of non recommended quantity of fertilizers and nutrients that may deplete the productivity in future due to higher toxic contamination.

The major risk in the STGs is due to pricing decision of the price fixing bodies which includes collection agents, large estate factories and bought leaf factories. It is viewed that prospect of rise in price is shrinking due to weaker bargaining power of the STGs. Although profitability and liquidity wise STGs are in a comfortable position, it is likely that post COVID pandemic situation will be more difficult. Different formulas applied by Tea Board of India for fair pricing of tea leaves are also ineffective. The district level committee for fixing price of tea leaves is also facing difficulty to ascertain good price.

The recent extremities in the climatic condition are causing uncertainty for the tea industry. As for example, after 2020, abrupt change in the climate is deepening the problem with comparatively shortened flushing period. From the study of the factors which determine production

level, it is found that better infrastructure and inputs for STGs is a paramount need. The other factors which are found to be important are organizational behavior, agronomic and climatic factor, budgetary and other constraints, inherent capacity and scientific innovation.

In case of administrative capacity, financial inclusion, market scenario is not showing an active role of the institution. Information asymmetry is intense among the STGs which has become an instrument of exploitation for the decision making bodies. At the training and information sharing with an application of appropriate technology is highly expected by the STGs but it is not in proper shape. Contract pricing evolved out of leasing of STGs is not beneficial. The profit though earned through leased contract is not viable than actual profit earned in the owner operated STGs. Moreover, the future risk of losing productivity is higher in leased contract due to mismanagement of fields, use of unrecommended quality fertilizers and nutrients which enhances productivity initially but reduces in future. Also plucking method by the use of sickle spoils the tea plants.

The STGs are although literate but by characteristic they are semi skilled and deficient in information reception based on real time which creates gap in their decision making. STGs do not have proper knowledge of the end user market and their role is confined till the market intermediaries in the form of green leaf selelr. This has made STGs non receptive about the market signals. STGs entrepreneurial skills are also

limited and they do not take part in the end marketing and processing of tea leaves which has a huge opportunity with exceptional profit.

6.12 SUGGESTIONS

The cohesive system for successful implementation of policy is necessary. Formulation of policy in regard to the plantation is always a priority but in actual terms the lack of monitoring and evaluation method is always creating a gap. However, following suggestions can be put forward to elevate the curve of the performance of small tea growers-

1. The price mechanism and the government's decision on green leaf price is not in harmony. The real intent of the government decision on support price is not favouring the small tea growers in a right direction. Hence, a more holistic step should be taken by the government so that adequate relief and a threshold price can be ensured for the small tea growers during the period of distress.

2. The training and information sharing has a strong role in small tea growers performance. So, the frequency of training and information sharing by the research association with collaboration of government agencies should be increased for any necessary execution of decision which could be taken for quality enhancement and determination of production level. The training should be given more for application of recommend quantity of inputs such as fertilizers, pesticides and weedicides so that no adverse

effect could arise. The awareness on plucking and planning standard should be increased which can reduce the price and productivity loss in future. The project like ‘Mission qualitea’ should be expanded with more participation and initiative.

3. The organizational form of the SHG is extremely poor in Golaghat district. A number of small tea growers are working under SHGs which is not an encouraging scene. By working as a SHG, they can be self reliant by forming a corpus fund and simultaneously face any contingency. Under a SHG, they can take charge of transportation and selling their product without the involvement of collection agents and sell their product on collective basis by drawing exact precision.

4. The small tea growers by forming a FPO (Farmers Producers Organization) or FPC (Farmers Producers Company) can take part in processing activity. In Assam, the STGs can follow up the model of KTDC of Kenya where mini plants could be set up and at the same time they could access the need and demand of the end consumer. The detachment of STGs from the auction and direct selling market of the made tea is the root cause of under pricing of their product which can be effectively reduced by transforming into a processing entity. The transfer of technology in the small tea gardens is convenient when it takes the shape of an organized form where collective decision has a strong role in which Tea Board of India can also contribute.

5. The government of Assam is taking steps to provide land pattas to the landless STGs but the quantity wise it is not sufficient. Government should expedite the process to provide land pattas to the STGs so that they can register their plantation under Tea Board of India and can derive maximum benefit from the board. The registrations of STGs can reduce the financial problems and can increase the level of financial inclusion of the STGs. It is seen that lack of registration is also a hurdle to avail the financial schemes or loans from the financial institutions which can be overcome with the registration of more and more STGs.

6. The formal record keeping of the STGs should be strongly encourage. Without the record keeping of the STGs the scope of better management and reduction of waste is low. The absence of record keeping also makes the control function redundant. The performance of the STGs could be maintained as well as improvise with the introduction of formal record keeping system of the farm.

7. The government should encourage the STGs to become organic but before converting to the organic farming of tea, a co-operative structure should be initiated. The organic farming is characterized by low yield but higher return which should be accepted by the STGs. Before, adopting organic farming Government should device a policy which can neutralize the risk of growing organic tea and should also ensure a better market.

8. The growing number of STGs is also creating an environment hazard which is resulted by erratic nature of climate and fall in productivity. The deforestation should be discouraged with a policy direction to ensure better sustainability of the cultivation. On the other hand Government should encourage planting of saplings with lucrative incentives to restore a stable ecology conducive for tea cultivation. The adverse cost of environment also has a negative impact on tea farming.

9. The management of STGs in an efficient way should be monitored by setting up an advisory body. The management should be undertaken in pruning and plucking methods, application of inputs, rejuvenation, replantation and new plantations whenever necessary. The recommendations should be drawn from frequent observations which should be implemented with guidelines provided to the STGs. The performance evaluation of the STGs should be regularly maintained with better transparency and establishment of accountability. Most of the STGs are suffering from information inadequacy as well as knowledge gap which should be sufficiently taken care of by the agencies.

10. The decision on price taken by BLFs is not satisfactory for the STGs and perception of the STGs towards them is periodly flawed. The stricker regulations of BLFs could be a win-win situation for both BLFs and STGs. In this case, BLFs could gain certificates from the quality assessors which enable them to place their product in auction market for better price or

make them eligible to directly sell to the reputed brokers. In that case, STGs can also demand a better price for the BLFs.

11. The vocal bodies like AASTGA, NETA, ATPA should be more proactive to keep the STGs demand on the right table. The role should be more accountable so that STGs or marginal farmers could get their dues. The transitions of STGs business are highly dependent on their role but in actual terms they are working at a sub-optimal level. AASTGA should include more people from technical and management background so that their problems could be placed before the respective ministries. They should plan a time bound goal by encouraging more participation from the STGs. Based on a model, the activities should be undertaken to derive out maximum benefits envisioned by them.

6.13 AREAS OF FURTHER RESEARCH

The scope of the present study was confined to the growth and performance of small tea grower in Golaghat district of Assam.The study can be utilized in the tea industry as well as to the diverse fields of plantations with further research. Following are the fields for further research.

- .The study can be useful to work out a plan to restore a positive organic growth of the marginal tea growers
- The financial and non financial performance can be balance with an appropriate management practices for the tea plantation.

- The study can identify the important activities in the value chain system which can be further controlled with more timely correction measures
- The satisfaction level study of the small tea growers can be elevated with further study by improving the situation of administrative structure, financial inclusion, marketing activity and by evolving a better system of training and knowledge sharing.

It is expected that more research will bring more productivity and efficiency by indicating a better score of performance which can be further applied to the relevant field.

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Appendices1: Questionnaire

QUESTIONNAIRE

1.Name of the Respondent:_____

2.Block ,Sub-division, District:_____

3.Size of plantation area:_____

4.Year of Plantation:_____

Section-I

Please read the following and give your response by putting a tick(✓) mark on items that qualifies you

1.Age (in Years)

a)Below 25 ○

b)25 to 40 ○

c)40 to 55 ○

d)Above 55 ○

2.Sex

a)Male ○

b)Female ○

3.Marital Status

a)Married ○

b)Unmarried ○

c)Divorced ○

4.Place of residence

a)Rural ○

b)Urban ○

5.Occupation

a)Service ○

b)Business ○

c)House wife ○

d)Student ○

e)Others ○

6.Eduational Background

a)Literate ○
b)Matriculate ○
c)Graduate ○
d)Post Graduate ○

7.Frequency of allocation of plucking or other devoted time

a)Daily ○
b)Weekly ○
c)Fortnightly ○
d)Monthly ○

8.Status of the profession

a)Primary ○
b)Additional to other ○
c)Casual ○

9.Distance from the processing plant

a)0-5 km ○
b)5-10 km ○
c)More than 10km ○

10.Mode of selling

a)Self ○
b)Through collection agent ○
c)Sold through SHG ○

11.Annual Income

a)Below 50,000 ○
b)50,000-1,00,000 ○
c)1,00,000-250,000 ○
d)2,50,000> ○

12.Land Classification

a)Annual leased patta ○
b)Periodic Patta ○
c)Tauji Bahi land ○
d)Government land ○

13.Maintrnance of Records

a)Not having past knowledge ○
b)Unable to accommodate time ○
c)Lack of training ○
d)Budgetary constraint to appoint an accountant ○

14.Capital Reserves

a)Self ○

b)Borrowing from agents ○

c)Borrowing from other sources ○

d)Borrowing from banks/financial institutes ○

15.Age of plantation

a)0-10 years ○

b) 10-30years ○

c)30-50 years ○

d)5 0years above ○

Section-II

1. In Golaghat District of Assam ,Small Tea Growers has a dominant role in the production of green tea leaves which is the main raw material for processed tea .The effect on tea productivity is being judged on the basis of the factor productivity. Thirty specific factors has been identified in this matter and you are requested to rank it by putting the tick (✓) mark in a scale of order 1,2,3,4,5,6 and 7 on the basis of your knowledge and experience. Whereas1= Strongly disagree, 2= Disagree, 3= Somehow Disagree, 4=No comment, 5=Somehow Agree, 6=Agree, 7= Strongly agree

Sl. No	Factors	Strongly agree	Somehow Agree	Agree	No Comment	Some How Disagree	Disagree	Strongly Disagree
1	Rainfall							
2	Temperature							
3	Fertility of soil							
4	Application of fertilizer and nutrients							
5	Application of knowledge							
6	Working capital							
7	Cost of Labour							
8	Availability of Labour							
9	Skill of labour							
10	Uses of tea variety							
11	Loan facility							
12	Green leaves price							

13	Information availability							
14	Plucking and pruning							
15	Agent Grower relation							
16	Cooperation among growers							
17	Quality of green leaf							
18	Training and extension services							
19	Irrigation facility							
20	Market competition							
21	Level of education							
22	Bought leaf factory							
23	Transportation							
24	Subsidy							
25	Bonus and social security							
26	Processing technology							
27	Plantation technology							
28	Institutional role							
29	Acreage							
30	Utilisation of land							

2. LABOUR PRODUCTIVITY

i. PLUCKING PRODUCTIVITY(MAN-DAY PER HECTARE)

GROWTH STAGE

YEAR 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
PLUCKING PRODUCTIVITY

ACTIVE PLUCKING PERIOD
YEAR 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
PLUCKING PRODUCTIVITY

SLOWER GROWTH
YEAR 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
PLUCKING PRODUCTIVITY

EXTENDED GROWTH
YEAR 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
PLUCKING PRODUCTIVITY

ii. INPUT –OUTPUT RATIO

YEAR	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
INPUT										
OUTPUT										

3. PRICE VARIATIONS OF GREEN LEAVES

GROWTH STAGE

YEAR	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
PRICE PER KG										

ACTIVE FLUSHING PERIOD

YEAR	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
PRICE PER KG										

SLOWER GROWTH

YEAR	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
PRICE PER KG										

EXTENDED GROWTH STAGE

YEAR	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
PRICEPER KG										

4. OPERATING PROFIT TO SALES

YEAR	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
OPERATING PROFIT										
SALES										

5. CURRENT RATIO

YEAR	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
CURRENT ASSETS										
CURRENT LIABILITIES										

1. COST TO PROFIT RATIO

YEAR	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
COST										
OPERATING PROFIT										

Section-III

In this section, The researcher tries to collect responses from the respondents on level of satisfaction and perception towards role of institutions vital for performance of small tea growers ranging from strong level of satisfaction to lowest level or strong dissatisfaction on a scale ranging from 1 to 7 and respondents are requested to give your responses by putting tick (✓)mark-Wheras-1= Strongly disagree, 2=Disagree, 3=Somehow Disagree, 4= Nocomment, 5= Some-howAgree, 6=Agree, 7=Strongly agree

Questionnaire on Perception and Satisfaction of Small Tea Growers towards institutional role

Administrative structure

Questions	Strongly agree=7	Agree =6	No Response =5	Disagree =4	Somehow Disagree =3	Dis agree=2	Strongly Disagree=1
1.Administrative structure is supportive and Cooperative							
2.Efficient implementation of programs/schemes							
3.Good communication in sharing knowledge and information							
4.Availability of good data base system							
5.Adequate control over market							
6.Prevent irregularities and lacuna in market							

Financial Inclusion

Questions	Strongly agree=7	Agree =6	Somehow Agree =5	No response =4	Somehow Disagree =3	Disagree=2	Strongly Disagree=1
1.Availability of adequate financial support							
2.Maintains good ratio of loan with respect to the land and no of beneficiary							
3.Different financial schemes are available							
4.Repayment of loan is satisfactory							
5.Low rate of interest or easy availability of subsidy							
6.Good financial scrutiny and supervision							

Marketing activity							
Questions	**Strongly agree=7**	**Agree =6**	**Somehow Agree =5**	**No response =4**	**Somehow Disagree =1**	**Disagree =2**	**Strongly Disagree=1**
1.Adequate marketing opportunities are available							
2.Efficient distribution channels							
3.Good pricing mechanism exists							
4.Forward contract price is satisfactory							
5.Bought leaf factories fulfills the expectation of STG's							
6.Price determination in auction market is satisfactory							
7.Marketing expenses are within control limit							
8.Pricing yield reasonable return on investment							

Training and knowledge sharing							
Questions	**Strongly agree=7**	**Agree =6**	**Somehow agree =5**	**No response =4**	**Somehow Disagree**	**Disagree =2**	**Strongly Disagree=1**
1.Training improves productivity							
2.Training and extension services reduces flaws							
3.Training and services enhances quality							
4.Training helps to bring transfer of technology							
5.Training encourages good agricultural practice							
6.Training brings more quality and sustainability							

SECTION-IV

ADDITIONAL INFORMATION

i. PRICE PER KG AND QUANITIY PRODUCED PER HECTARE OF GREEN LEAVES-

YEAR	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
PRICE										
QUANITY										

ii. OTHER INFORMATION-

Appendices-2: Statistical tables and figures

Table1:Component Transformation Matrix								
Component	1	2	3	4	5	6	7	8
1	.892	.247	.303	.185	-.010	.001	.047	.121
2	-.329	.578	.238	.305	.494	.258	.296	.103
3	.002	.593	-.214	-.396	-.297	-.407	.361	-.248
4	-.197	-.070	.874	-.226	-.264	-.002	-.017	-.265
5	.016	-.071	.168	-.455	.557	-.518	-.130	.405
6	.140	.070	-.087	-.676	.082	.706	.008	.077
7	-.019	.426	-.047	.008	.078	-.005	-.854	-.284
8	-.193	.238	.056	.034	-.524	.034	-.183	.770

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Fig1:Component Plot in Rotated space

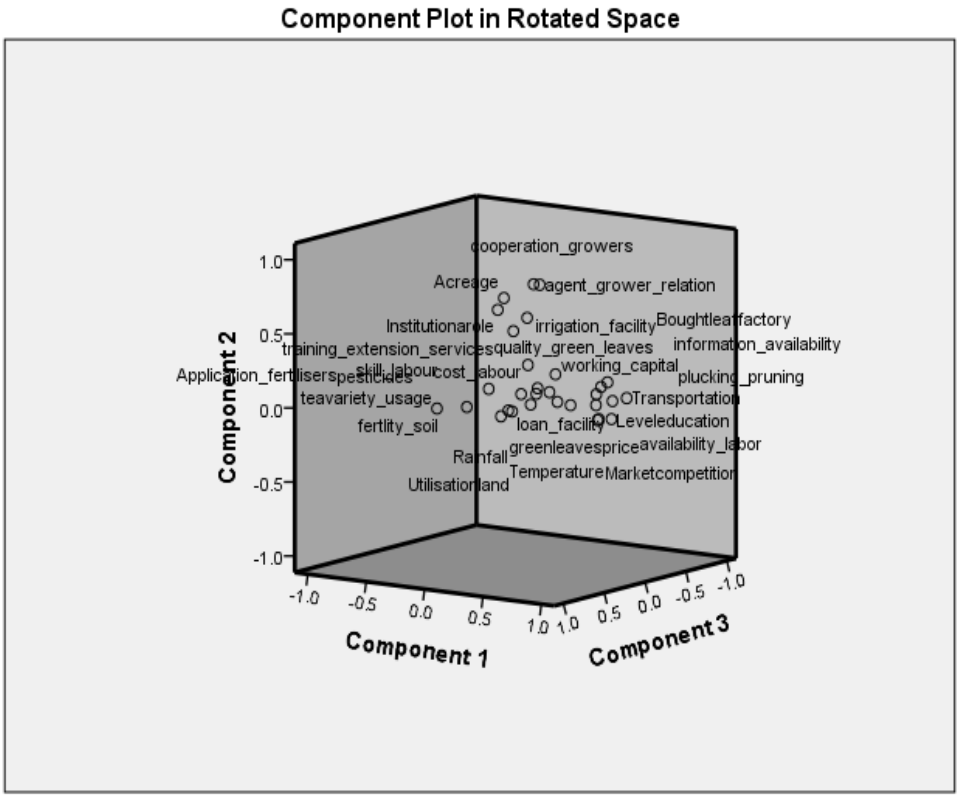

Table2: Test of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
a1perception	0.38	400	0	0.665	400	0
a1satisfaction	0.248	400	0	0.822	400	0
a2perception	0.273	400	0	0.861	400	0
a2satisfaction	0.269	400	0	0.779	400	0
a3perception	0.374	400	0	0.71	400	0
a3satisfaction	0.315	400	0	0.711	400	0
a4perception	0.436	400	0	0.539	400	0
a4satisfaction	0.285	400	0	0.738	400	0
a5perception	0.421	400	0	0.598	400	0
a5satisfaction	0.399	400	0	0.61	400	0
a6perception	0.401	400	0	0.611	400	0
a6satisfaction	0.445	400	0	0.504	400	0
f1perception	0.223	400	0	0.859	400	0
f1satisfaction	0.347	400	0	0.739	400	0
f2perception	0.25	400	0	0.773	400	0
f2satisfaction	0.384	400	0	0.685	400	0
f3perception	0.249	400	0	0.835	400	0
f3satisfaction	0.354	400	0	0.638	400	0
f4perception	0.331	400	0	0.789	400	0
f4satisfaction	0.34	400	0	0.719	400	0
f5perception	0.313	400	0	0.856	400	0
f5satisfaction	0.338	400	0	0.652	400	0
f6perception	0.247	400	0	0.841	400	0
f6satisfaction	0.336	400	0	0.73	400	0
m1perception	0.352	400	0	0.728	400	0
m1satisfaction	0.341	400	0	0.766	400	0
m2perception	0.386	400	0	0.679	400	0
m2satisfaction	0.229	400	0	0.87	400	0
m3perception	0.451	400	0	0.597	400	0
m3satisfaction	0.365	400	0	0.754	400	0
m4perception	0.394	400	0	0.721	400	0
m4satisfaction	0.39	400	0	0.677	400	0
m5perception	0.388	400	0	0.608	400	0
m5satisfaction	0.349	400	0	0.773	400	0
m6perception	0.461	400	0	0.571	400	0
m6satisfaction	0.383	400	0	0.703	400	0
m7perception	0.474	400	0	0.527	400	0
m7satisfaction	0.312	400	0	0.691	400	0
m8perception	0.361	400	0	0.731	400	0
m8satisfaction	0.3	400	0	0.692	400	0
t1perception	0.299	400	0	0.747	400	0
t1satisfaction	0.206	400	0	0.908	400	0
t2perception	0.354	400	0	0.699	400	0
t2satisfaction	0.224	400	0	0.888	400	0
t3perception	0.354	400	0	0.699	400	0
t3satisfaction	0.203	400	0	0.901	400	0
t4perception	0.268	400	0	0.84	400	0
t4satisfaction	0.208	400	0	0.907	400	0
t5perception	0.287	400	0	0.827	400	0
t5satisfaction	0.18	400	0	0.903	400	0
t6perception	0.272	400	0	0.731	400	0
t6satisfaction	0.272	400	0	0.729	400	0

a. Lilliefors Significance Correction

Table-3: Correlation matrix

Correlation Matrix[a]

	f1	f2	f3	f4	f5	f6	f7	f8	f9	f10	f11	f12	f13	f14	f15	f16	f17	f18	f19	f20	f21	f22	f23	f24	f25	f26	f27	f28	f29	f30
f1	1.00	0.76	0.40	0.48	0.20	0.30	0.14	0.31	0.29	0.12	0.27	0.15	0.21	0.22	0.28	0.09	0.08	0.11	0.36	0.38	0.32	0.07	0.20	0.48	0.49	0.45	0.46	0.07	-0.07	-0.02
f2	0.76	1.00	0.49	0.56	0.22	0.28	0.31	0.39	0.27	0.37	0.21	0.19	0.32	0.15	0.29	0.15	0.12	0.03	0.43	0.47	0.43	0.08	0.31	0.55	0.56	0.52	0.53	0.10	-0.01	0.01
f3	0.40	0.49	1.00	0.63	0.14	0.21	0.24	0.13	0.06	0.16	-0.03	-0.15	0.16	-0.16	-0.02	0.06	0.05	-0.04	0.09	0.05	-0.09	0.02	-0.20	0.13	0.12	0.07	0.11	0.29	0.09	-0.03
f4	0.48	0.56	0.63	1.00	0.19	0.23	0.28	0.25	0.12	0.18	0.10	0.01	0.32	-0.12	0.14	0.17	0.24	0.12	0.29	0.23	0.15	0.12	0.04	0.33	0.31	0.30	0.31	0.20	0.01	-0.12
f5	0.20	0.22	0.14	0.19	1.00	0.37	0.23	-0.41	-0.28	0.10	0.09	0.39	0.43	-0.09	0.22	0.07	0.04	0.02	-0.01	-0.16	0.03	0.00	-0.01	-0.08	0.05	0.11	0.04	-0.01	0.23	-0.12
f6	0.30	0.28	0.21	0.23	0.37	1.00	0.67	0.15	-0.05	0.23	0.03	0.17	0.48	0.03	0.24	0.37	-0.09	0.17	0.29	0.28	0.37	0.24	0.25	0.37	0.39	0.43	0.45	0.21	0.08	-0.42
f7	0.14	0.31	0.24	0.28	0.23	0.67	1.00	0.26	-0.10	0.34	-0.09	0.27	0.45	0.00	0.24	0.30	-0.14	0.16	0.19	0.33	0.34	0.14	0.29	0.38	0.41	0.40	0.44	0.28	0.00	-0.55
f8	0.31	0.39	0.13	0.25	-0.41	0.15	0.26	1.00	0.66	0.26	0.08	-0.14	0.03	0.27	0.12	0.15	-0.07	-0.05	0.40	0.52	0.49	0.05	0.60	0.64	0.59	0.58	0.58	0.16	-0.19	-0.01
f9	0.29	0.27	0.06	0.12	-0.28	-0.05	-0.10	0.66	1.00	-0.25	0.31	-0.19	-0.30	0.51	0.13	0.07	0.09	-0.11	0.33	0.32	0.35	0.04	0.34	0.45	0.38	0.41	0.38	0.09	-0.15	0.08
f10	0.12	0.37	0.16	0.18	0.10	0.23	0.34	0.26	-0.25	1.00	-0.21	0.29	0.46	-0.23	0.22	0.13	-0.14	-0.15	0.01	0.10	0.21	-0.04	0.29	0.09	0.21	0.16	0.20	-0.08	0.03	-0.07
f11	0.27	0.21	-0.03	0.10	0.09	0.03	-0.09	0.08	0.31	-0.21	1.00	0.24	0.13	0.53	0.09	0.11	0.19	-0.10	0.45	0.41	0.31	-0.10	0.23	0.40	0.40	0.35	0.41	0.09	-0.13	0.00
f12	0.15	0.19	-0.15	0.01	0.39	0.17	0.27	-0.14	-0.19	0.29	0.24	1.00	0.35	-0.03	0.21	0.08	-0.07	0.07	-0.06	0.03	0.23	0.06	0.18	0.17	0.25	0.20	0.25	0.00	-0.17	-0.22
f13	0.21	0.32	0.16	0.32	0.43	0.48	0.45	0.03	-0.30	0.46	0.13	0.35	1.00	0.18	0.39	0.36	0.01	0.03	0.38	0.41	0.35	0.15	0.43	0.37	0.40	0.38	0.38	0.09	0.16	-0.26
f14	0.22	0.15	-0.16	-0.12	-0.09	0.03	0.00	0.27	0.51	-0.23	0.53	-0.03	0.18	1.00	0.22	0.16	0.23	-0.01	0.57	0.60	0.50	0.04	0.53	0.51	0.51	0.46	0.48	0.08	-0.08	-0.03
f15	0.28	0.29	-0.02	0.14	0.22	0.24	0.24	0.12	0.13	0.22	0.09	0.21	0.39	0.22	1.00	0.65	0.33	0.32	0.23	0.19	0.35	0.50	0.27	0.20	0.33	0.40	0.18	0.35	0.51	-0.12
f16	0.09	0.15	0.06	0.17	0.07	0.37	0.30	0.15	0.07	0.13	0.11	0.08	0.36	0.16	0.65	1.00	0.44	0.30	0.26	0.16	0.23	0.42	0.21	0.18	0.28	0.33	0.20	0.49	0.34	-0.36
f17	0.08	0.12	0.05	0.24	0.04	-0.09	-0.14	-0.07	0.09	-0.14	0.19	-0.07	0.01	0.23	0.33	0.44	1.00	0.43	0.17	0.08	0.06	0.35	0.02	0.12	0.16	0.20	0.14	0.31	0.25	0.12
f18	0.11	0.03	-0.04	0.12	0.02	0.17	0.16	-0.05	-0.11	-0.15	-0.10	0.07	0.03	-0.01	0.32	0.30	0.43	1.00	0.05	0.09	0.18	0.51	0.03	0.17	0.18	0.25	0.10	0.22	0.27	0.08
f19	0.36	0.43	0.09	0.29	-0.01	0.29	0.19	0.40	0.33	0.01	0.45	-0.06	0.38	0.57	0.23	0.26	0.17	0.05	1.00	0.82	0.57	0.09	0.54	0.72	0.64	0.69	0.66	0.06	-0.05	-0.09
f20	0.38	0.47	0.05	0.23	-0.16	0.28	0.33	0.52	0.32	0.10	0.41	0.03	0.41	0.60	0.19	0.16	0.08	0.09	0.82	1.00	0.72	0.18	0.62	0.82	0.73	0.74	0.77	0.06	-0.15	-0.18
f21	0.32	0.43	-0.09	0.15	0.03	0.37	0.34	0.49	0.35	0.21	0.31	0.23	0.35	0.50	0.35	0.23	0.06	0.18	0.57	0.72	1.00	0.23	0.69	0.66	0.66	0.81	0.71	-0.03	-0.11	-0.18
f22	0.07	0.08	0.02	0.12	0.00	0.24	0.14	0.05	0.04	-0.04	-0.10	0.06	0.15	0.04	0.50	0.42	0.35	0.51	0.09	0.18	0.23	1.00	-0.01	0.17	0.21	0.31	0.09	0.47	0.41	-0.10
f23	0.20	0.31	-0.20	0.04	-0.01	0.25	0.29	0.60	0.34	0.29	0.23	0.18	0.43	0.53	0.27	0.21	0.02	0.03	0.54	0.62	0.69	-0.01	1.00	0.66	0.71	0.68	0.66	-0.09	-0.05	-0.01
f24	0.48	0.55	0.13	0.33	-0.08	0.37	0.38	0.64	0.45	0.09	0.40	0.17	0.37	0.51	0.20	0.18	0.12	0.17	0.72	0.82	0.66	0.17	0.66	1.00	0.88	0.85	0.89	0.17	-0.13	-0.04
f25	0.49	0.56	0.12	0.31	0.05	0.39	0.41	0.59	0.38	0.21	0.40	0.25	0.40	0.51	0.33	0.28	0.16	0.18	0.64	0.73	0.66	0.21	0.71	0.88	1.00	0.89	0.90	0.28	0.04	-0.01
f26	0.45	0.52	0.07	0.30	0.11	0.43	0.40	0.58	0.41	0.16	0.35	0.20	0.38	0.46	0.40	0.33	0.20	0.25	0.69	0.74	0.81	0.31	0.68	0.85	0.89	1.00	0.88	0.27	0.05	-0.11
f27	0.46	0.53	0.11	0.31	0.04	0.45	0.44	0.58	0.38	0.20	0.41	0.25	0.38	0.48	0.18	0.20	0.14	0.10	0.66	0.77	0.71	0.09	0.66	0.89	0.90	0.88	1.00	0.19	-0.16	-0.10
f28	0.07	0.10	0.29	0.20	-0.01	0.21	0.28	0.16	0.09	-0.08	0.09	0.00	0.09	0.08	0.35	0.49	0.31	0.22	0.06	0.06	-0.03	0.47	-0.09	0.17	0.28	0.27	0.19	1.00	0.44	-0.06
f29	-0.07	-0.01	0.09	0.01	0.23	0.08	0.00	-0.19	-0.15	0.03	-0.13	-0.17	0.16	-0.08	0.51	0.34	0.25	0.27	-0.05	-0.15	-0.11	0.41	-0.05	-0.13	0.04	0.05	-0.16	0.44	1.00	0.34
f30	-0.02	0.01	-0.03	-0.12	-0.12	-0.42	-0.55	-0.01	0.08	-0.07	0.00	-0.22	-0.26	-0.03	-0.12	-0.36	0.12	0.08	-0.09	-0.18	-0.18	-0.10	-0.01	-0.04	-0.01	-0.11	-0.10	-0.06	0.34	1.00

Table4: Significance level

Sig. (1-tailed)	f1		0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.03	0.05	0.01	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.07	0.08	0.36
	f2	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.45	0.44
	f3	0.00	0.00		0.00	0.00	0.00	0.00	0.11	0.00	0.27	0.00	0.00	0.00	0.37	0.12	0.14	0.21	0.04	0.17	0.03	0.38	0.00	0.01	0.07	0.01	0.03	0.04	0.26
	f4	0.00	0.00	0.00		0.00	0.00	0.00	0.01	0.00	0.02	0.45	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.21	0.00	0.00	0.00	0.00	0.40	0.01
	f5	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.02	0.04	0.00	0.00	0.04	0.00	0.08	0.21	0.35	0.42	0.00	0.31	0.48	0.46	0.05	0.16	0.01	0.21	0.43	0.00	0.01
	f6	0.00	0.00	0.00	0.00	0.00		0.00	0.14	0.00	0.30	0.00	0.00	0.28	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00
	f7	0.00	0.00	0.00	0.00	0.00	0.00		0.02	0.00	0.03	0.00	0.00	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.00
	f8	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.05	0.00	0.00	0.26	0.00	0.01	0.00	0.06	0.16	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.42
	f9	0.00	0.00	0.11	0.01	0.00	0.14	0.02	0.00		0.00	0.00	0.00	0.00	0.01	0.08	0.04	0.02	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.04	0.00	0.06
	f10	0.01	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.02	0.00	0.19	0.00	0.04	0.00	0.05	0.29	0.09
	f11	0.00	0.00	0.27	0.02	0.04	0.30	0.03	0.05	0.00	0.00		0.00	0.01	0.00	0.04	0.01	0.03	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.04	0.01	0.48
	f12	0.00	0.00	0.00	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.27	0.00	0.05	0.06	0.06	0.10	0.25	0.00	0.12	0.00	0.00	0.00	0.48	0.00	0.00
	f13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.01	0.00		0.00	0.00	0.00	0.39	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00
	f14	0.00	0.00	0.00	0.01	0.04	0.28	0.48	0.00	0.00	0.00	0.27	0.00		0.00	0.00	0.00	0.42	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.05	0.06	0.29
	f15	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.04	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	f16	0.03	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.01	0.05	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	f17	0.05	0.01	0.14	0.00	0.00	0.21	0.03	0.00	0.04	0.00	0.03	0.08	0.39	0.00	0.00		0.00	0.00	0.06	0.11	0.00	0.33	0.01	0.00	0.00	0.00	0.00	0.01
	f18	0.01	0.27	0.21	0.01	0.35	0.00	0.00	0.15	0.02	0.00	0.03	0.06	0.30	0.42	0.00	0.00		0.00	0.16	0.04	0.00	0.26	0.00	0.00	0.02	0.00	0.00	0.05
	f19	0.00	0.00	0.04	0.00	0.42	0.00	0.00	0.00	0.00	0.40	0.00	0.10	0.00	0.00	0.00	0.00	0.16		0.00	0.00	0.03	0.00	0.00	0.00	0.11	0.18	0.04
	f20	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.25	0.00	0.00	0.00	0.06	0.04	0.00		0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00
	f21	0.00	0.00	0.03	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.28	0.02	0.00
	f22	0.09	0.07	0.38	0.01	0.48	0.00	0.00	0.15	0.23	0.19	0.03	0.12	0.00	0.21	0.00	0.00	0.00	0.00	0.15	0.00		0.39	0.00	0.00	0.03	0.00	0.00	0.02
	f23	0.00	0.00	0.00	0.21	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.26	0.00	0.00	0.00	0.39		0.00	0.00	0.03	0.18	0.46
	f24	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.23
	f25	0.00	0.00	0.01	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.21	0.42
	f26	0.00	0.00	0.07	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.18	0.02
	f27	0.00	0.00	0.01	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.03
	f28	0.07	0.02	0.00	0.00	0.43	0.00	0.00	0.00	0.00	0.05	0.04	0.48	0.03	0.05	0.00	0.00	0.00	0.00	0.11	0.13	0.28	0.00	0.03	0.00	0.00	0.00		0.10
	f29	0.08	0.45	0.04	0.40	0.00	0.05	0.49	0.00	0.00	0.29	0.01	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.18	0.00	0.02	0.00	0.18	0.21	0.00	0.00	0.00	
	f30	0.36	0.44	0.26	0.01	0.01	0.00	0.00	0.42	0.06	0.19	0.48	0.00	0.00	0.29	0.01	0.00	0.01	0.05	0.94	0.00	0.02	0.46	0.23	0.42	0.02	0.03	0.10	0.00

a. Determinant = 6.0595-014