

# Commercial Viability of Blue Tea Production in North 24 Parganas District: A Comparative Study with Green Tea<sup>1</sup>

\*Saikat Dutta, Research Scholar, Department of Commerce, University of Gour Banga, Malda, West Bengal, India, Assistant Professor, Department of Commerce, Sree Chaitanya Mahavidyalaya, North 24 Parganas, West Bengal, India, Email: [duttasaikat33@gmail.com](mailto:duttasaikat33@gmail.com), Phone No. (91) 8240884972

\*\*Goutam Bhowmik, Professor of Commerce, Department of Commerce, University of Gour Banga, Malda, West Bengal, India, Email: [ramagoutambhowmik@gmail.com](mailto:ramagoutambhowmik@gmail.com), Phone No. (91) 9434337418

## Abstract

Blue Tea is generally made from Blue Butterfly Pea Flower (scientifically called as '*CliteriaTernatea. L*' and commonly identified as "Aparajita" or "Neelkanta") which is a common plant in most of the Southeast Asian countries. The prime objective of the present study is to explore the long-term economic and commercial viability of production of Blue Tea in North 24 Parganas District. Besides, the study comparatively analysed the process, estimated cost and return associated with manufacturing of Blue Tea and Green Tea and highlighted the prospects and challenges associated with Blue Tea as a substitute of Green Tea. Green Tea is chosen for comparison with Blue Tea because flavour of Blue Tea is more or less similar to Green Tea. The study is basically explorative in nature. Most of the data are collected from on-the-spot inspection of manufacturing facility situated in North 24 Parganas district. Various **cost and inflation accounting techniques** are used to **estimate costs and return**. The study revealed that in spite of lack of Government support, absence of any kind of research and

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development, marketing and other promotion related initiatives, Blue Tea production in North 24 Parganas District has shown enormous economic potential.

**Keywords:** *Blue Tea, Sustainable Cost of production, Return on Capital Employed.*

## I. INTRODUCTION

Health and wellness food market is booming very fast more particularly after the outbreak of COVID 19 pandemic. In 2022, the global health and wellness food market was valued at \$ 841 billion and is anticipated to increase to one trillion U.S dollars by 2026 ([www.statista.com](http://www.statista.com) on 18-10-2022). Popularity of herbal tea, especially green tea in modern times may be attributable to this mind set. Green Tea as a wellness product accounts for 21% of total tea production all over the world. But recently Blue Tea has emerged a substitute of green tea though the product itself is not altogether new to the Indians. Blue Tea is generally made from Blue Butterfly Pea Flower (scientifically called as "*Cliteria Ternatea. L*" and commonly popular as "*Aparajita*" or *Neelkanta*") which is a very common plant grown in most of the Southeast Asian countries. The *Ayurveda* prescribes the consumption of blue tea as a memory enhancer, nootropic, antistress, anxiolytic, anti-depressant, anti-convulsant, tranquilizing and sedative agent ([www.pubmed.ncbi.nlm.nih.gov](http://www.pubmed.ncbi.nlm.nih.gov) on 04-12-2022). The main nutritional advantage of Blue Tea is it supplements with zero caffeine, which naturally increases human metabolism. Due to this major anti-aging property, it is becoming popular over the world particularly in Asian Countries (such as, Vietnam and Thailand), European countries and North American Countries as a health drink. After the outbreak of the COVID-19 pandemic, the Blue Tea consumption among the people has been on the rise. As per the *Research and Markets Report* (The World's Largest Market Research Store), the Butterfly Pea Flowers market is estimated to grow at a CAGR of 5.5% from 2020 to 2027 to reach \$102.4 million by 2027. This obviously offers a chance to harness the full potential of Butterfly Pea Flower especially in those regions where the flower is naturally grown in abundance. West Bengal is one such region where the Blue Butterfly Pea flower is grown naturally almost everywhere. Recently, it is commercially cultivated in North 24 Parganas District. This Butterfly Pea flower plant needs minimum care, fertilizer, pesticide and almost no irrigation facility. This flower is basically used as a part of religious rituals. But its use as a wellness and health drink is commercially explored by Mr. Gobinda Biswas of Ghaighata Block, North 24 Parganas district when he established a small-scale unit for Blue Tea production under the banner 'Kolkata Farmers' to

which about 40 Butterfly Pea flower farmers are attached (The Bartaman, p.4 dated 29<sup>th</sup> June 2022).

The present study made a humble effort to explore the commercial viability of Blue Tea as a substitute of Green along with estimation of cost and return with reference to the ‘Kolkata Farmers’. A survey-based case study approach is adopted to capture the prospects and challenges with the processing of Blue Tea in North 24 Parganas District of West Bengal.

## II. LITERATURE REVIEW

Blue Tea is a novel idea or concept in India and as such is outside the arena of academic research. However, some related literatures are there. The essence of such related literatures is tabulated below:

Year	Author(s)	Essence of the study
2003	Gomez and Kalamani	Analysed the distribution, plant description, agronomic characteristics, genetic difference, medicinal use, chemical configuration and application of Butterfly Pea in livestock production.
2012	Suebkhampet and Sotthibandu	Evaluated the effectiveness of the rudimentary extract from butterfly pea flowers on animal blood smear staining.
2018	Chen, <i>et al.</i>	Highlighted that health benefits of the butterfly pea flower fermentation solution in human body. The study also concluded that butterfly bean flowers is an effective raw material for natural beauty care products.
2019	Bewar	By using New Product Development model, the study evaluated the product cost and suitability of mock tail drinks using butterfly pea flower.
2019	Lakshan <i>et al.</i>	Investigated commercial potential of blue pea flower extract beverage having functional properties.
2021	Madukoklla <i>et al.</i>	Evaluated the colour, pH, moisture, titratable acidity, fibre, ash, and energy value of Butterfly Pea flower and also commercial potentiality of jelly incorporated with Butterfly Pea Flower extract.
2021	Sofiah <i>et al.</i>	Determined the physicochemical properties (moisture content, ash content and antioxidant activity) and

		organoleptic properties in Blue Tea with a combination of ginger.
2022	Weeransinghe	Study demonstrated the medicinal properties of Butterfly Pea flower such as nootropic activity, antioxidant activity, analgesic activity, anti-inflammatory and antibacterial activity, which helps treating diabetics, blood pressure, retinal damage, edema, and indigestion etc.

The above review pointed out absence of any research work on the issue of commercial viability of Blue Tea processing especially in the context of India and more particularly in relation to North 24 Parganas District.

On this context, the present paper attempts to highlight the processes involved in the Blue Tea and Green Tea production along with their estimated of cost and return. It would also attempt to understand the business-related opportunities and challenges associated with Blue Tea production and how blue it will sustain in the long run as a substitute of Green Tea.

### III. OBJECTIVES OF THE STUDY

The prime objective of the study is to explore the long-term economic viability of Blue Tea produced in North 24 Parganas District as a substitute of Green Tea. The specific objectives of the study are:

- To highlight the process involved in production of Blue Tea and Green Tea;
- To estimate cost and return associated with Blue Tea and Green Tea Production;
- Factor-wise comparative analysis between Blue Tea and Green Teen and
- To identify the prospects and challenges associated with Blue Tea production as a substitute of Green Tea in North 24 Parganas District.

### IV. METHODOLOGY

The study is mainly explorative in nature. It tries to explore and highlight the processes involved in production of Blue Tea and Green Tea along with estimation of cost and return. The relevant information and contextual issues were captured from the onsite inspection of 'Kolkata Farmers' production facility (Small Manufacturing Unit) and interview of Mr. *Gobinda Biswas*<sup>2</sup>, Blue Tea producer, in *Ghaigata Block*, North 24 Parganas District on 18-07-

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<sup>2</sup>**Name of the Blue Tea Producer:** Mr. *Gobinda Biswas*.

**Organisation Name:** Kolkata Fermars.

**Address:** Village- Bishupur, Block: Ghaighata, District: North 24 Parganas (West Bengal).

2022 and 21-11-2022. Therefore, the data used are of primary and secondary in nature. Afterward, various cost and inflation accounting procedures were used to calculate costs and return. In this case study, leaf Blue Tea is the main product, that's why all estimation and assessment have been done on leaf variety of Blue Tea.

The Green Tea is chosen for comparison against Blue Tea because flavour of Blue Tea is similar to Green Tea<sup>3</sup>. Moreover, both Blue Tea and Green Tea belong to wellness drinks or health drinks category. Naturally, consumer will be tempted to compare two products before he or she wants to consume Blue Tea.

For purpose of estimation, some realistic assumptions are made, e.g.

- For computing depreciation, the life of dryer and grinder machine are assumed to be 10 years and that of workshop building is 20 years. Straight line method of depreciation is used for these assets.
- For estimating the construction cost of factory building for Blue Tea, the opinion of a construction professional is taken into consideration.
- Whole production process falls under the category of "Micro Manufacturing Unit".
- Yearly standard production is assumed to be 2000 Kgs.

## V. BLUE TEA AND GREEN TEA PRODUCTION PROCESS

### V.I Blue Tea Production Process

The basic raw material of Blue Tea is the petals of Blue Butterfly Pea Flower. The Blue Tea is usually of two types – leaf and dust variety. Blue Butterfly Pea flowers are mainly collected in abundant quantity as during the conversion process huge weight loss is seen due to drying and processing. In dry season (March, April, and May), major share of raw material (i.e, Blue Butterfly Pea Flower) has been collected for continuous production round the year. The entire process can be conveniently presented through the flow-chart

#### CHART 1: Flow Chart of Blue Tea Processing

*Source: Constructed by authors, based on primary survey*

### V.II Green Tea Production Process:

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**Produces:** Mainly Leaf Blue Tea and some quantity of dust Blue Tea (a by-product).

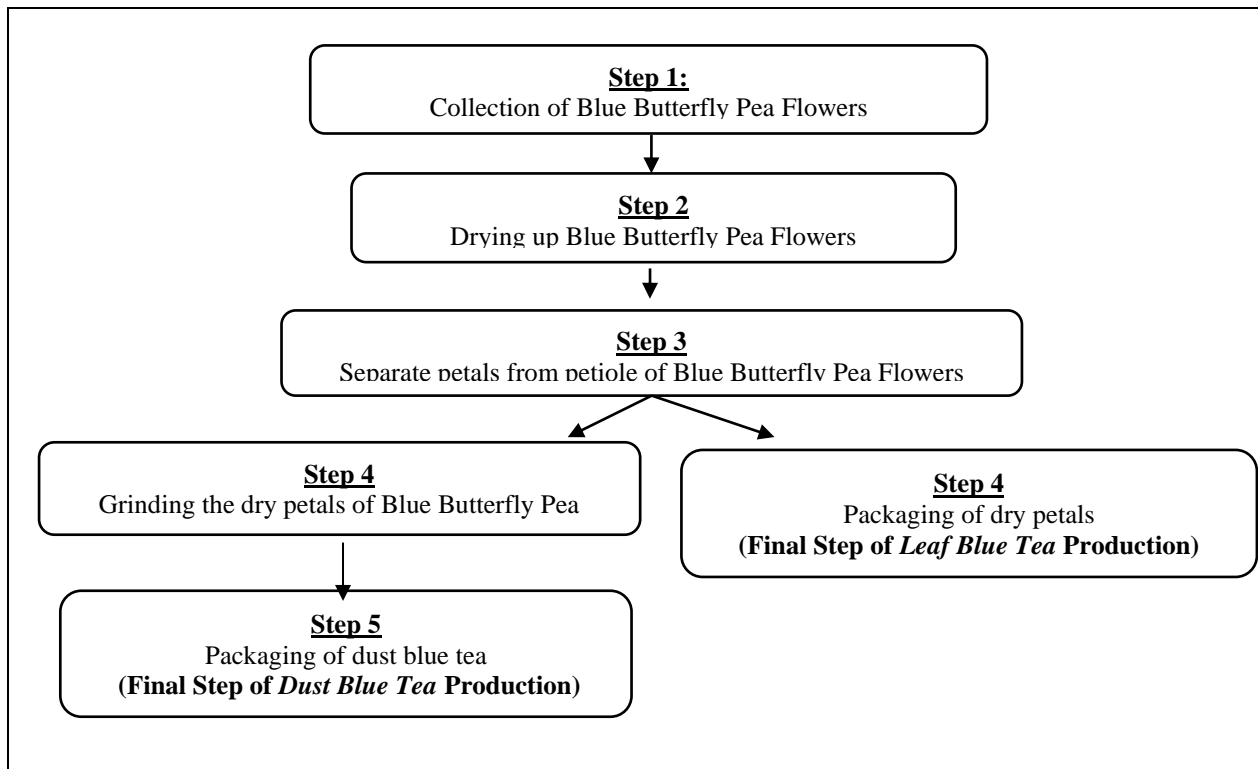
**Annual Production:** 2 Ton or 2000 Kg of Leaf Blue Tea.

<sup>3</sup>As per the article published in January 2016 on the Bon Appétit website the flavour of the Blue Tea is "earthy and woody", which is more similar to a fine Green Tea.

## Chart 2: Flow Chart of Green Tea Processing

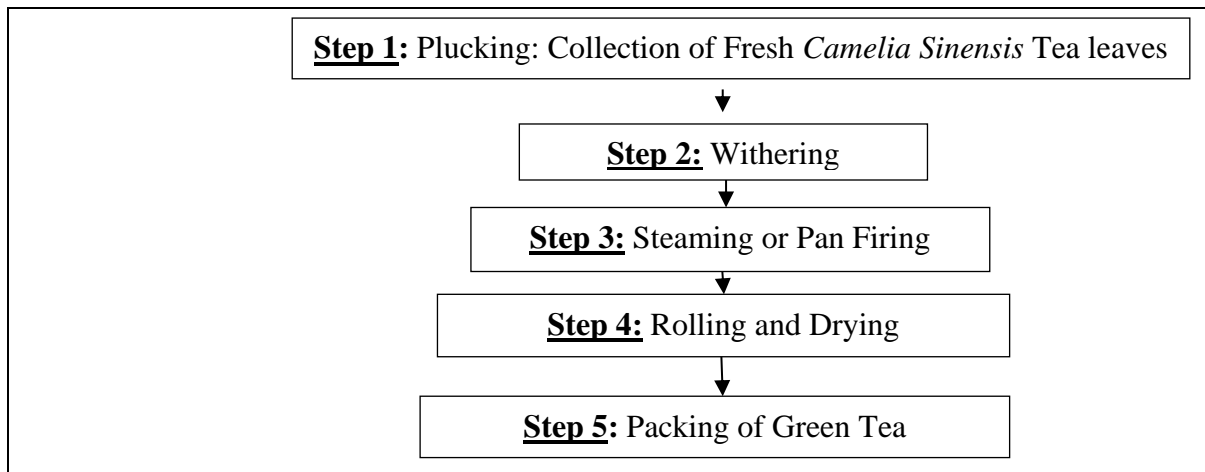
Source: [www.okcredit.com](http://www.okcredit.com), 30-07-2022

Tea manufacturing is a long process which requires much care, attention, control and scientific understanding. Basically, four types of tea are consumed all over world, like: White Tea, Green Tea, Oolong Tea and Black Tea. The White Tea is least processed, its enzyme is deactivated by steaming and dried. The Oolong Tea and Black Tea both are gone through the process of fermentation by allowing oxidation. But Green Tea is non fermented tea and its enzyme is deactivated by steaming or panning the green leaves. The Green Tea manufacturing is gone through five steps. The entire process can be conveniently presented through the flow-chart 2.



## VI. ESTIMATION OF COST AND RETURN ON BLUE TEA AND GREEN TEA

### VI.I Estimation of Cost and Return of Blue Tea



**Table 2: Standard Capital Requirement for Production of 2000 KG Leaf Blue Tea Annually**

Particulars	Amount Rs.	Amount Rs.
<b><u>Fixed Capital</u></b>		
Dryer Machine	3,50,000	
Grinder Machine	24,000	
Land (524 square ft, for construction of Work-Shop Building)	1,00,000	
Workshop Building (324 square ft)	<u>4,50,000</u>	9,24,000
<b><u>Annual Working Capital</u></b>		17,33,500
(Per Unit Cost of Processing x Annual Production, i.e., Rs.866.75 x 2000)		
<b>Total</b>		<b>26,57,500</b>

*Source: Constructed by authors, based on primary survey*

From table 2 it is evident that for producing 2 Tonnes of Leaf Blue Tea, the fixed capital is estimated at Rs. 9, 24,000. While for maintaining day to day activities, Rs. 17,33,500 is required as a working capital. On the other hand, 40000 KG of raw Blue Butterfly Pea Flowers are needed to produce 2000 KG of *Leaf Blue Tea per annum*. The estimated cost of production is presented in table 3.

**Table 3: Calculation of Estimated Total Cost of Processing 2000 KG of Blue Tea**

Particulars	Quantity (KG)	Per Unit (KG) Rs.	Amount Rs.	Remarks
i) Raw Material Purchase	<b>40,000 (Input)</b>	27.50	11,00,000	
ii) Carriage Inward		1.00	40,000	
iii) Power Charge: For Drying		0.55	22,000	For 3 Months (Rainy Season): (40000 x 2.2 x 3/12)
iv) <u>Labour Charge</u> • For drying petals in sunlight • For separation of petals		3.00 1.00	1,20,000 40,000	
v) <b>Prime Cost (i+ii+iii+iv)</b>		<b>33.05</b>	<b>13,22,000</b>	
vi) <u>Factory Overhead</u> • Electricity • Depreciation		0.45 1.12	18,000 44900	
vii) <b>Works Cost (v+vi)</b>		<b>2,000 (Output)</b>	692.45 <b>(On Output)</b>	<b>13,84,900</b>
viii) Office and Administrative Overhead	<b>2,000</b>	51.00	1,02,000	Rs. 8500 Per Month
ix) <b>Cost of Production (vii+viii)</b>		<b>743.45</b>	<b>14,86,900</b>	
x) <u>Selling and Distribution Overhead</u> • Packing Charge		3.30 120.00	6,600 2,40,000	

• Carriage Outward				
<b>xi) Total Cost of Processing [ For Leaf Blue Tea] (ix+ x)</b>	<b>2,000</b>	<b>866.75</b>	<b>17,33,500</b>	
<b>xii) Grinding Charge</b>		10.00		
<b>xii) Total Cost of Processing [for Dust Blue Tea] (xi+xii)</b>		<b>876.75</b>		

*Source: Data are collected from direct interview with the owner on 18-07-2022 and 21-11-2022*

The above cost sheet (Table 3) displayed the total processing cost of leaf Blue Tea and dust Blue Tea. The processing cost of leaf Blue Tea is summation of *Prime Cost* (Purchase of Raw material, Carriage Inward, Power Charge and labour Charge), *Factory Overhead* (Depreciation and Electricity Charge), *Office and Administrative Overhead* and *Selling and Distribution Overhead* (Packing Charge and Carriage Inward). In addition, for finding out the processing cost (Per KG) of dust Blue Tea (a by-product of Leaf Blue Tea), extra *Grinding Charge* is included on processing. From the above table, it is clear that the lion share of total cost is consumed by procurement/purchasing of raw materials. It is almost 63% of total processing cost  $[(11, 00,000/17, 33,500) \times 100]$ .

**Table 4: Estimation Annual Net Profit, Net Profit Ratio and Return on Capital Employed**

Particulars	Quantity (KG)	Per Unit (KG) Rs.	Amount Rs.
Selling Price (As per the data collected from Mr. Gobinda Biswas)	2000	3,000.00	60,00,000
Cost of sales (As per Table 4)		866.75	17,33,500
Profit		2133.25	42,66,500
Net Profit Ratio: (Net Profit/ Selling Price) x 100	$(42, 66,500/60, 00,000) \times 100= 71\%$		
Return on Capital Employed (RoCE): (Net Profit/ Capital Employed) x 100	$(42, 66,500/26,57,500) \times 100= 161\%$		

*Source: Constructed by authors, based on primary survey*

As per the table 4, it is clear that the RoCE and Net Profit ratio of the Blue Tea production are very high due to the high profit margin. The selling price of leaf Blue Tea (i.e, Rs. 3000 per KG), that is fixed by the ‘Kolkata Farmers’, is still very low in comparison to the selling price of popular Blue Tea brand, named ‘Blue Tea’ (i.e, Rs.9,967 per KG).

## VII.II Estimation of Cost and Return of Green Tea Processing

**Table 6: Standard Capital Requirement for Production of Green Tea [2000 KG Per Annum]**



Particulars	Amount Rs.	Amount Rs.
<b>Fixed Capital</b>		
Machinery & Plant	20,00,000	
Other Fixed Assets	2,00,000	
Pre-operational Expenses	1,00,000	
		23,00,000
<b>Annual Working Capital</b>		2,33,600
(Per Unit Cost of Processing x Annual Production, i.e., Rs.116.80 x 2000)		
<b>Total</b>		<b>25,33,600</b>

Source:(i) [www.okcredit.com](http://www.okcredit.com), 31-07-2023 and (ii) Authors' Calculation

From table 6, it is found that to produce 2 ton or 2000 kg of Green Tea, the total fixed capital (including machinery & plant, other fixed assets and other preoperational expenses) requirement is Rs. 23,00,000. While for maintaining day to day activities, Rs. 2,33,600 is required as working capital.

**Table 7: Estimation of Total Cost of Production of Green Tea (Per KG)**

Particulars	Rs. (Per KG)
(i) Green Leaf	60.00
(ii) Leaf Collection Expenses	3.00
(iii) Fuel and Power Charges	11.00
(iv) wages	10.00
<b>(v) Prime Cost (i+ii+iii+iv)</b>	<b>84.00</b>
(vi) Factory Overhead	5.00
<b>(vii) Works Cost (v+vi)</b>	<b>89.00</b>
(viii) Office and Administrative Overhead	3.00
<b>(ix) Cost of Production (vii+viii)</b>	<b>92.00</b>
(x) Selling and Distribution Overhead	6.00
<b>(xi) Cost of Processing (ix+x) in the year 2016</b>	<b>98.00</b>
<b>(xii) Cost of Processing in the Year 2022 (Converted) [98x WPI, 2022/WPI, 2016]</b>	<b>116.80</b>
<b>(xiii) Selling Price Per Unit (KG) [All India Average Auction Price, 2022]</b>	<b>373.43</b>

Source:(i)Twari and Chauhan, 2016 (ii)[www.techno-preneur.net](http://www.techno-preneur.net), 05-08-2023

(iii)[www. eaindustry.nic.in](http://www.eaindustry.nic.in) and (iv) Authors` Calculation

(v) [https://www.teaboard.gov.in/pdf/Annual\\_Price\\_2022\\_2022\\_23\\_pdf2822.pdf](https://www.teaboard.gov.in/pdf/Annual_Price_2022_2022_23_pdf2822.pdf).

The above cost sheet (Table 7) shows the processing cost of Green Tea. The processing cost of Green Tea is summation of *Prime Cost* (Purchase of Raw material, Leaf Collection Expenses, fuel and Power Charge and Wages), *Factory Overhead*, *Office and Administrative Overhead* and *Selling and Distribution Overhead* (Packing Charge and Carriage outward).

**Table 8: Estimation Annual Net Profit, Net Profit Ratio and ROCE of Green Tea Processing**

Particulars	Quantity of Production (KG)	Per Unit (KG) Rs.	Amount Rs.
Selling Price	2000	373.43	7,46,860
Cost of Processing		116.80	2,33,600
Profit		256.63	5,13,260
Net Profit Ratio: (Net Profit/ Selling Price) x 100	$(5,13,260/7,46,860) \times 100 = 68.72\%$		
Return on Capital Employed (RoCE): (Net Profit/ Capital Employed) x 100	$(5,13,260/25,33,500) \times 100 = 20.25\%$		

*Source: Authors` Calculation*

As per the table 8, it is clearly seen that the ROCE (i.e., 20.25%) is slightly above the standard ratio (20%) but Net Profit ratio (i.e., 68.72%) of the Green Tea processing is very high due to the high profit margin.

## VII. COMPARATIVE ANALYSIS BETWEEN BLUE TEA AND GREEN TEA PROCESSING

Table 9 presents the factor wise comparative analysis between Blue Tea and Green Tea. For this purpose, the following factors are taken into consideration:

**Table 9: Factor wise Comparative Analysis Between Blue Tea and Green Tea**

Factors	Blue Tea	Green Tea
Plant	Blue Butterfly Pea (Scientifically called as 'Cliteria Ternatea. L)	Tea (Scientifically called as <i>Camelia Sinensis</i> )
Nutritional Value	Caffeine Free	Caffeine Full

Capital Requirement	Less Capital Intensive	Capital Intensive
Nature of Labour Force	Mostly Unskilled Female Labour	Extremely Skilled Female Labour
Complexity of Production Process	Simple	Complicated
Normal Loss During Production Process	Very High (95%)	Very High (80%)
Cultivation Process of Plant	Very Simple	Much Complicated
Profitability	Very High (71 %)	Very High (68.72%)
RoCE	Very High (161%)	Standard (20.25%)
Boston Consultancy Group (BCG) Matrix Position	“Question Mark” (Relative Market Share Low but Growth Rate High)	“Star” (Relative Market Share and Growth Rate High)

Source: **Constructed by Authors**

## **VIII. PROSPECTS AND CHALLENGES ASSOCIATED WITH BLUE TEA PRODUCTION**

### **Prospects**

- Blue Tea making process is very simple compared to Green Tea. It needs nominal training and low capital requirement. Subsequently, Blue Tea making business will have huge economic potential in term of profit due to easy and cheap supply of raw material, low labour as well as low capital-intensive process and almost monopoly condition of market in comparison to Green Tea. That’s why; Blue Tea processing in micro and small enterprise form will be a viable business start-up for the North 24 Parganas District.
- After Covid-19 pandemic world, the culture of consuming healthy products has been growing among the middle class and lower middle-class people all over the world. As a result, a sizable permanent domestic and foreign demand situation has already developed for Blue Tea. So, introduction of Blue Tea as a caffeine-free local or home-made nutritional supplement or substitute of Green Tea will have huge scope of commercial sustainability.

- If Direct to Customers (D2C)<sup>4</sup> e-commerce model be adopted by the blue tea manufacturer, then there will be ample scope of earning super-normal profit.
- Presently, Blue Tea of 'Kolkata Farmers' is in a state of monopoly compared to Green Tea and enjoying huge profit margin. As a result, "Kolkata Farmer" has ample scope of opportunity to expand the relative share in market specially among middle class and upper middle-class people by reducing its profit margin.

### **Challenges**

The Blue Tea making business in North 24 Parganas District has some challenges. These are:

- Normal loss during the production process is around 95%. Due to this normal loss, per unit cost of sales is talking a gigantic leap. It is an important consideration from the point of view of sustainability of the product.
- Blue Tea is almost new product concept for Indians. To sustain in the market and compete with Green Tea as its substitute various research and development expenditure and after sales service initiatives are required for Blue Tea. But it is found that almost nil or nominal amount are spent for those purposes. If big enterprise enters in this business, then small size business entities may face serious trouble in future.
- Government offered various subsidies and technical supports for small scale industrial set up for Green Tea processing. To survive in long run, the Government initiatives are very much essential, particularly for start-up initiatives. But in the case of Blue Tea, no notable Government patronage is available.

### **IX. CONCLUDING OBSERVATIONS**

Blue Tea processing is classically a village level small scale enterprise, which has enormous future prospect in India as well as abroad as a substitute of Green Tea. In the course of processing of Blue Tea which uses village level inputs such as excess flower (which otherwise get perished or discarded) and surplus labour especially unskilled village women. Thus, Blue Tea processing business is not only using the local natural resources optimally but also utilises the local human resources, especially unskilled woman. Post Pandemic, '*Think globally, act locally*' is the new business tag line for every start up initiatives. Main feature of this business line are use of local natural resources in such a way that natural and organic products can be

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<sup>4</sup>D2C is basically an e-commerce business model. By which manufacturers sell their products directly to the ultimate consumer avoiding various intermediaries with in the supply chain, such as wholesalers, distributors, and retailers. In D2C model, sellers offer fair-priced products to the consumers and also save packaging, shipping, and retailers' commission costs. Fair priced products attract more customers and increase the total revenue and profit margins (www.ranosys.com, 17-12-2022).

produced which has universal demand. Production of Blue Tea in Ghaighata block of North 24 Parganas falls in the same line. As a start-up business, Blue Tea is more advantageous option rather than Green Tea processing business. It appears to be a golden opportunity for the rural people especially for unskilled or semi-skilled women by way of an alternative source of employability.

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