REVIEW ARTICLE

Tea and Tea Industry Scenario: A Review of World and Bangladesh Perspective

Abdullahi Ali Ibrahim[1*], Md. Sadekur Rahman[2], Md. Rubayet Al Ferdous Noman[3], Abdiaziz Hassan Nur[4]

Abstract

Tea, revered for its aromatic flavor and purported medicinal benefits, stands as a globally significant beverage. Major production regions include China, India, Sri Lanka, and Kenya, with Bangladesh emerging as a notable player. Despite global challenges, Bangladesh's tea industry has shown resilience and growth, contributing significantly to the national economy through employment and export revenues. The present review mainly focuses on an extensive review of the global tea industry with a detailed examination of the current scenario in Bangladesh and the status of tea cultivation in northern. The findings revealed that global tea market exhibits varied trends, with China leading in production growth and countries like Kenya and Sri Lanka experiencing export declines in 2023. Consumption rises in China and India contrast with declining demand in traditional importing regions. Decreasing auction prices highlight the need for adaptable cultivation and marketing strategies. In Bangladesh's tea industry has doubled production from 2014 to 2023, driven by improved practices and favorable climates. Despite challenges like the COVID-19 pandemic, the sector shows resilience, meeting domestic demand and contributing significantly to the national economy. The review also points out tea cultivation in northern Bangladesh, particularly in Panchagarh, has become a vital economic pillar since 1996, producing millions of kilograms annually and supporting thousands of smallholders and workers. Despite challenges such as fluctuating prices, tea farming continues to enhance local economies and improve livelihoods in the region. This paper underscores the need for sustainable practices and policies to support continued growth in the tea industry, ensuring it remains a vital economic driver while addressing global market shifts and environmental concerns.

Keywords: World tea review, Tea industry in Bangladesh, Status of tea cultivation, plain land tea cultivation.

International Journal of Tea Science (2024); DOI: 10.20425/ijts18204

Introduction

Tea is a popular non-alcoholic beverage that has gained popularity worldwide due to its purported medicinal value, making it a significant 'health drink'. (Carr and Stephens 1992; Chomchalow 1996; Cheruiyot et al. 2010; Mamun 2011a, b; Mamun and Ahmed 2011; Ali et al. 2014; Ahmed and Ahmed 2015; Ali et al. 2015; Rahman et al. 2017). Tea cultivation is limited to specific regions of the world due to climate and soil requirements (Vihaba, 2022). The majority of tea producing countries is in Asia with China, India, and Sri Lanka leading the way. Kenya, Malawi, Rwanda, Tanzania, and Uganda are major producers of African tea. Aside from these regions, some tea is produced in South America (Argentina, Brazil, and others), the Near East (Iran and Turkey), and the CIS (Russia and Georgia) (Basu et al., 2010). It is a major cash crop and exportable product in Bangladesh (Arancon *et al*. 2007) as domestic consumption of tea is increasing at 3.5% per year (BTB, 2015).

The global tea market stands as a testament to the enduring popularity of this aromatic beverage with an estimated annual consumption of 6.5 million metric tons and a market value projected to reach $73.7 billion by 2027 (Jain & Jain, 2021), tea continues to captivate consumers across continents. Regions such as China, India, Sri Lanka, and Kenya dominate production, with China alone accounting for over 40% of the world's tea output (FAO, 2020).

However, the landscape of the tea industry is evolving, driven by shifting consumer preferences and demands. The rise of specialty teas, including green tea, herbal infusions, and organic blends, reflects a growing health-conscious consumer base (Euromonitor International, 2022). Additionally, sustainability concerns and ethical sourcing practices are becoming paramount, influencing purchasing decisions and industry practices (Cesareo & McMullen, 2023).

Nestled in the lush hills of its northern regions, Bangladesh has emerged as a significant player in the global tea market. The country's tea industry dates back to the mid-19th century, with British colonial influences shaping its cultivation and export (Rahman, 2019). Today, Bangladesh ranks among the top tea producers globally, renowned for its distinct tea varieties, including the prized Darjeeling tea (Bangladesh Tea Board, 2020).

Despite facing challenges such as climate change impacts and labor issues, Bangladesh's tea industry continues to thrive, supported by innovative farming practices and a growing emphasis on quality (Islam et al., 2021). The sector contributes significantly to the country's economy, providing employment to thousands and contributing to export revenues (Ahmed & Sadiq, 2022). However, There are now 162 tea estates with around 60.179 hectares of

[1]MS Student, Department of Agricultural Extension, Hajee Mohammad Danesh Science and Technology University, Dinajpur-5200, Bangladesh

[2]Professor, Department of Agricultural Extension, Hajee Mohammad Danesh Science and Technology University, Dinajpur-5200, Bangladesh

[3]Assistant Professor, Department of Agricultural Extension, Hajee Mohammad Danesh Science and Technology University, Dinajpur-5200, Bangladesh

[4]MS Student, Department of Agricultural Extension, Hajee Mohammad Danesh Science and Technology University, Dinajpur-5200, Bangladesh

Corresponding Author: Abdullahi Ali Ibrahim, MS Student, Department of Agricultural Extension, Hajee Mohammad Danesh Science and Technology University, Dinajpur-5200, Bangladesh, e-mail: Abdullahiali226@gmail.com

How to cite this article: Ibrahim AA, Rahman MS, Noman MRAF, Nur AH. Tea and Tea Industry Scenario: A Review of World and Bangladesh Perspective. International Journal of Tea Science 2024, 18(2):20-31.

Source of support: Nil

Conflict of interest: None

Received: 22/09/2024; **Revised:** 03/11/2024; **Accepted:** 30/12/2024

tea plantation and the tea industry contributes 0.11 percent of GDP through job creation and export earnings (Ahammed, 2012), (Raliman *et al.* 2020, and Ahmad & Hossain, 2013).

The main reasons for this increase in tea productivity are the expansion of tea growing areas as well as the cultivation of Bangladesh Tea series tea clones (BT clones) released by the Bangladesh Tea Research Institute (BTRI). Bangladesh Tea Research Institute (BTRI) has released 21 high-yielding and high-quality clones, as well as five hybrid seed stocks of biclonal and polyclonal origin (Alam, 2002). And BTRI has so far released 23 clones and 5 biclones with an average per hectare yield of 3461.67 kg (BTRI, 2020).

Bangladesh Tea Board and the Government of Bangladesh have decided to expand tea plantations in several new suitable locations around Bangladesh by developing small holding tea farming systems. Following the implementation of that system, more than 2.5 million kg of tea was added from the northern districts to the national tea in 2015, and the country's overall tea production was approximately 67.38 million kg. (Anonymous, 2015). Moreover, many unemployed persons in this area have found work in the tea industry. Anyone can see it as a minor revolution in the socio-economic state of this backward village as a result of the adoption of the small holding tea planting concept in this area. Tea cultivation in the plain lands of northern Bangladesh is relatively limited compared to the hilly regions. However, there have been efforts to expand tea cultivation in the plain lands, especially in areas with suitable agro-climatic conditions. Therefore, the present paper aims to address the following objectives.

- To provide a comprehensive review of world tea
- To explore the present scenario of tea industry in Bangladesh
- Overview the status of tea cultivation in northern Bangladesh

Materials And Methods

This paper is mainly based on secondary data. Hence, data were collected from different journals, research articles, books and news journals, statistics from Bangladesh tea board, Bangladesh tea research institute etc. Relevant books and journal were sourced through extensive search in databases such as Google scholar. After collecting relevant information, it was compiled and logically presented in the present format.

Review of Major Findings, Discussion and News Journals

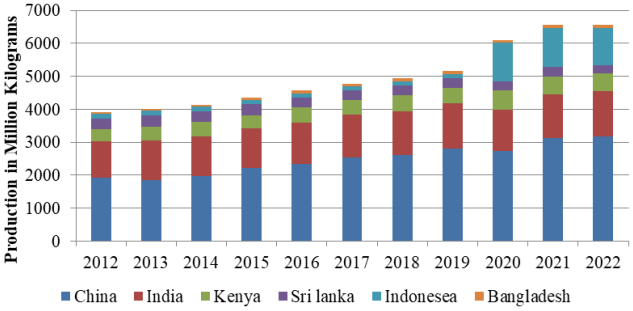
Since this paper is totally a review, the major findings observed along with appropriate discussions, are presented here in order of the initially stated objectives.

Comprehensive review of world tea

Tea production worldwide by leading country

Statista (2022) reported tea production worldwide by leading country (Figure 1). Found that China production increased from 1915 million kg in 2012 to 3181.039 million kg in 2022. India, China, Sri Lanka and Kenya were rated as the world's largest tea-exporting countries. Although Bangladesh's tea production shows a general upward trend with some variability, the highest production was in 2019 with 96.07 million kg and 2021 with 96.50 million kg.

Hence, the data highlights diverse trends in tea production across different countries. While China and India show consistent growth (World Bank, 2023), Kenya and Sri Lanka exhibit more variability and decline, respectively. Indonesia's production is notably inconsistent, and Bangladesh shows gradual improvement.



Source: (Statista, 2022 & BTB)

Figure 1: Tea production worldwide from 2012 to 2022, by leading country

Understanding these trends can help stakeholders in the tea industry make informed decisions regarding cultivation practices and market strategies.

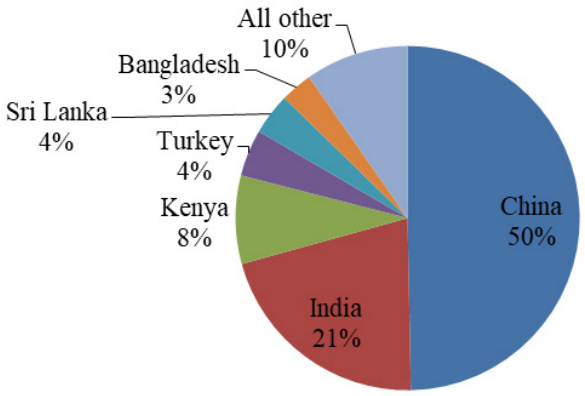
Percentage share of tea production in major tea producing countries

Firsdtea (2023) reported that China dominated global tea production with a 50 percent share, followed by India at 21 percent. Kenya contributed 8 percent, while Turkey and Sri Lanka each held a 4 percent share. Bangladesh accounted for 3 percent of the production, and all other countries collectively made up the remaining 10 percent.

World Tea export

The global tea export market exhibited notable changes in 2023 compared to the previous years, with many major tea-producing countries experiencing a decline in their exports. Kenya, the largest exporter among the countries listed, reported a significant decrease in tea exports, dropping by 50 million kg (-18.2%) from 2022 to a total of 224.8 million kg in 2023. Similarly, Sri Lanka's exports fell by 13.8 million kg (-8.4%), reaching 151.6 million kg, and China experienced a decline of 9.9 million kg (-4.0%) to 237.2 million kg. India's tea exports decreased by 8.4 million kg (-5.9%), totaling 133.3 million kg.

In contrast, Tanzania bucked the trend with an increase in tea exports, rising by 2.2 million kg (19.9%) to 13.2 million kg. Other countries such as Uganda and Indonesia saw significant reductions



Source: (Firsdtea, 2023)

Figure 2: Percentage share in major Tea producing countries in 2022

Table 1: World Tea export (Million Kg)

Country	*Jan to*	*2023*	*2022*	*+/-*	*%*	*2021*	*2020*
Kenya	July	224.8	274.8	-50.0	-18.2	558.9	518.9
Sri Lanka	Aug	151.6	165.4	-13.8	-8.4	282.9	262.7
China	Aug	237.2	247.1	-9.9	-4.0	369.4	348.8
India	Aug	133.3	141.7	-8.4	-5.9	196.5	209.7
Tanzania	Jun	13.2	11.0	2.2	19.9	24.2	24.0
Uganda	Jun	33.0	44.4	-11.4	-25.7	72.0	70.4
Indonesia	July	20.4	26.3	-5.9	-22.3	42.6	45.3
Malwai	Aug	32.0	34.0	-2.0	-5.9	38.0	42.7
Argentina	Jun	32.7	34.6	-2.0	-5.7	69.0	66.0
Bangladesh	Aug	0.7	0.5	0.2	52.2	0.7	2.2
Taiwan	Aug	4.9	5.4	-0.5	-9.3	9.0	8.0
Total		883.7	985.2	-101.5	-10.3	1663.2	1598.6
All Countries			1828			1918.4	1849.6

Source: (Indiatea.org, 2023 & ITC)

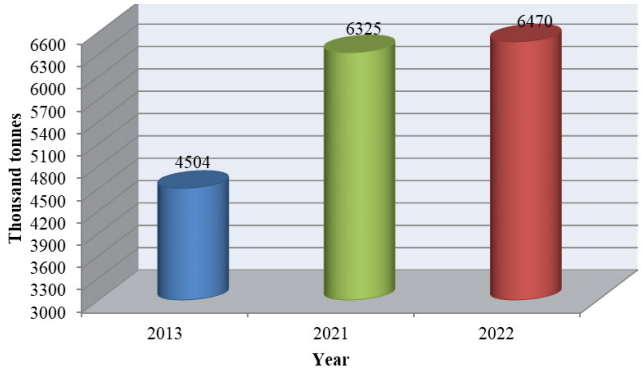
in their exports, with Uganda's exports falling by 11.4 million kg (-25.7%) to 33 million kg, and Indonesia's by 5.9 million kg (-22.3%) to 20.4 million kg. Malawi and Argentina also reported declines, with Malawi's exports decreasing by 2 million kg (-5.9%) to 32 million kg, and Argentina's by 2 million kg (-5.7%) to 32.7 million kg. Bangladesh and Taiwan showed smaller changes, with Bangladesh's exports increasing by 0.2 million kg (52.2%) to 0.7 million kg, while Taiwan's exports decreased by 0.5 million kg (-9.3%) to 4.9 million kg.

Overall, the total tea exports from all major countries listed fell by 101.5 million kg (-10.3%) from 2022, totaling 883.7 million kg in 2023. This decrease in exports is part of a broader trend observed across many tea-producing nations

World Tea Consumption

Several factors influence demand for tea, including prices, income and demographics such as age, education, occupation and cultural background. Furthermore, as consumers are increasingly looking for healthier and natural beverage options, the demand for specialty and premium teas has surged, creating new opportunities for the tea market.

Over the last decade, world tea consumption increased annually by 3.3 percent, reaching 6.5 million tonnes in 2022 (Figure 3). The expansion was underpinned by the rapid growth in per capita income levels, notably in China, India and other Asian and emerging economies. Growth in demand was particularly marked in China and Pakistan, where consumption over the last decade expanded at an annual rate of 6.5 percent and 8.1 percent, respectively. Consumption in China, the largest consumer of tea, reached 3 million tonnes in 2022, representing a share of 46 percent of global consumption. India, the second largest consumer, accounted for a share of nearly 18 percent, with 1.16 million tonnes in 2022, followed by Türkiye with 250 021 tonnes, Pakistan, with 247 498 tonnes, and the Russian Federation, with 132 544 thousand tonnes. At the global level, tea consumption expanded by 2.0 percent in 2022 compared to 2021, and further increased in 2023, as the market continues to be underpinned by robust demand.



Source: (FAO, 2024)

Figure 3: World tea consumption

Tea consumption in traditional importing countries of Europe and North America has been declining due to increasing competition from other beverages, particularly bottled water, carbonated drinks and coffee, while for the Russian Federation, tea imports have been negatively impacted by the war in Ukraine.

World average tea auction price

The table outlines the average tea auction prices at various international centers from January to September, comparing 2023 to 2022. Most centers, including Kolkata, Guwahati, Cochin, Mombasa, Limbe, and Colombo, experienced a decline in prices in both local currencies and USD. For example, Kolkata saw a decrease from INR 240.25 in 2022 to INR 209.44 in 2023, translating to a drop from $3.10 to $2.54 per kg. Chittagong was a notable exception, with prices increasing slightly in local currency but still decreasing in USD terms, highlighting the impact of currency fluctuations. Exchange rates varied significantly, with the Indian Rupee, Bangladeshi Taka, and Sri Lankan Rupee depreciating against the USD, exacerbating the decline in tea prices when converted to USD.

Table 2: World average tea auction price

Centre	January to September (per Kg)									
	In Country wise Currency				In INR (Approx.)			In US $ (Approx)		
	Currency	2023	2022	+/-	2023	2022	+/-	2023	2022	+/-
Kolkata	INR	209.44	240.25	-30.81	209.44	240.25	-30.81	2.54	3.10	-0.56
Guwahati	INR	193.22	196.43	-3.21	193.22	196.43	-3.21	2.35	2.54	-0.19
Cochin	INR	140.20	141.41	-1.21	140.20	141.41	-1.21	1.70	1.83	-0.12
Chittagong	BDT	192.08	190.35	1.73	147.45	163.74	-16.29	1.79	2.12	-0.33
Jakarta	US Cents			0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mombasa (Kenya)	US Cents	226.00	249.00	-23.00	186.13	192.73	-6.59	2.26	2.49	-0.23
Limbe	US Cents	135.09	142.66	-7.57	111.26	110.42	0.84	1.35	1.43	-0.08
Colombo	SL Rs	1186.78	1193.87	-7.09	296.72	300.33	-3.61	3.60	3.88	-0.28
Exchange Rates: (approx.) US$ 1 =	Jan-Sep				India	Bangladesh	SL			
2023			82.36	107.29	329.41					
2022			77.40	89.98	307.68					

Source: (Indiatea.org, 2023 & ITC)

This overall decline in tea prices suggests a global trend potentially driven by factors such as changes in supply and demand, climatic conditions, and economic influences. The depreciation of local currencies against the USD further intensified the price drops in international terms. Future analysis should investigate the role of supply chain disruptions, climate change impacts on tea production, economic conditions affecting consumer purchasing power, and shifting market demand patterns to understand better the forces shaping the global tea market.

Status of Bangladesh's Tea Industry

Location and classification of tea establishment in Bangladesh

The graph illustrates the geographical distribution and classification of tea establishments in Bangladesh, emphasizing a high concentration in the Sylhet division, known for its suitable climate and soil for tea cultivation and it is the major tea-producing region of the country Islam *et al.* (2021)

The graph categorizes tea establishments into large-scale plantations, smallholder farms, and cooperative societies, with distinct symbols and colors for each category. Large-scale plantations, primarily corporate-owned, are depicted prominently due to their substantial production capacities, while smallholder farms and cooperatives, though more numerous, contribute smaller individual outputs.

Month-wise production in 2021, 2022 and 2023 (In million kilograms)

The Table presents monthly tea production data in Bangladesh for the years 2021 to 2023, showing an overall increasing trend. January through December, each month's production is recorded in million kilograms. For instance, production in January 2023 was 364 million kilograms, whereas it was 507 million kilograms in 2022 and 286 million kilograms in 2021. The data indicates a significant rise in production during peak months, particularly from July to December, with the highest production observed in December 2023 at 102,918 million kilograms. This trend highlights the seasonal variability and potential growth in the tea industry.

Bangladesh's tea production (Million kg)

The graph depicts the annual tea production in Bangladesh from 2014 to 2023, showcasing a significant upward trend. Starting at 63.88 million kg in 2014, tea production has more than doubled to 102.92 million kg by 2023. This growth reflects the expanding capacity and increasing importance of the tea industry in Bangladesh.

Between 2014 and 2016, production saw a steady rise, reaching 80.05 million kg. Despite a slight decline to 78.95 million kg in 2017, the industry quickly recovered, peaking at 96.07 million kg in 2019. The dip to 86.39 million kg in 2020 likely resulted from the COVID-19 pandemic's impact on labor and supply chains.

The subsequent years show resilience and recovery, with production rebounding to 96.51 million kg in 2021 and reaching a record 102.92 million kg in 2023. These fluctuations underscore the sector's vulnerability to external factors but also highlight its adaptability and growth potential.

Overall, the trend indicates robust growth in Bangladesh's tea industry, contributing positively to the economy through increased export revenues and improved livelihoods. Continued support and innovation will be key to sustaining this growth in the future.

Bangladesh's tea production per acre (In kg)

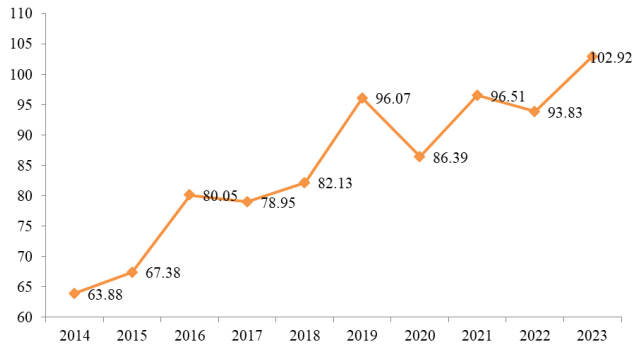
The graph illustrates the tea production per acre in Bangladesh, highlighting a significant increase in yield efficiency over recent years.

This improvement reflects advancements in cultivation practices, better resource management, and favorable climatic conditions in key tea-producing regions like Sylhet. The data shows that these enhancements have resulted in higher productivity

Table 3: Location and classification of tea establishment in Bangladesh

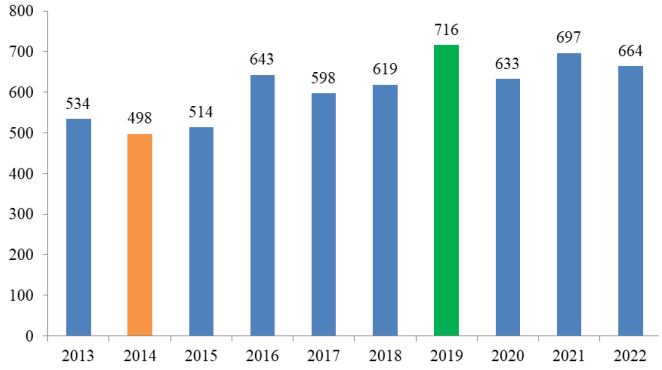
Location of tea establishments in Bangladesh		*Classification of tea establishments in Bangladesh*		
Districts	*Number*	*Categories*	*Range of production (Kg/year)*	*Number of tea establishments*
Mouvibazar	91	A	Equal of more than 181,000 kg	135
Habiganj	25	I	Equal or more than 113,000 kg	
Sylhet	19	B	Between 109,000 to 181,000 kg	8
Chattogram	21	II	Between 45,000 kg to 113,000 kg	
Rangamati	2	C	Less than 109,000 kg	24
Panchagarh	8	III	Less than 45,000 kg	
Thakurgaon	1			
Total	167			

Source: Financial express (2024)



Source: Press xpress (2023)

Figure 4: Tea production over the years



Source: BTB

Figure 5: Average tea production per over the past decade

per acre, which is crucial for meeting the growing domestic and international demand for Bangladeshi tea. This upward trend in yield per acre underscores the potential for continued growth and development within the country's tea industry (Bangladesh Tea Board, 2023).

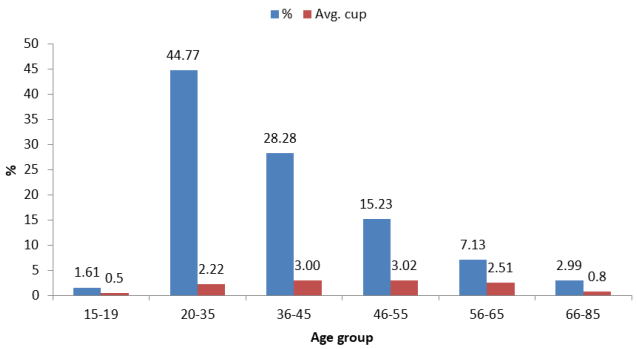
Table 4: Month-wise production in 2021, 2022 and 2023 (In million kilograms)

Month	*Production 2023*	*Production 2022*	*Production 2021*
	*Up to the month**	*Up to the month**	*Up to the month**
January	364	507	286
February	410	540	305
March	2,457	2,125	1,986
April	7,563	7,059	5,918
May	15,835	14,479	12,069
June	26,551	27,063	25,423
July	40,205	38,330	37,761
August	54,695	49,093	52,148
September	68,990	63,833	64,755
October	83,583	75,211	79,333
November	95,124	86,050	89,574
December*	102,918	93,829	96,506

Source: Bangladesh Tea Board, 2023

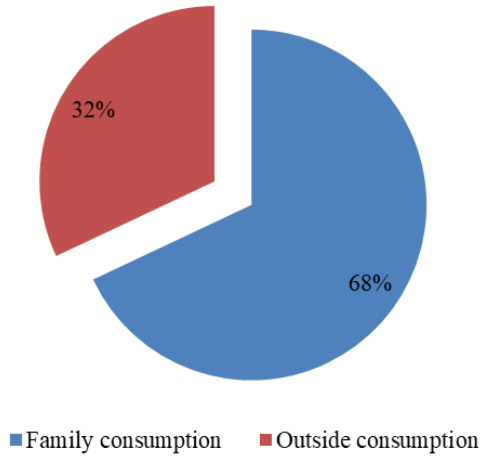
Tea consumption in Bangladesh

District-wise data was tabulated and analyzed to determine daily cup consumption and annual tea consumption. The results were prepared for the entire population of Bangladesh using data from the Bangladesh Bureau of Statistics (Manik, 2024). In the calculations, children (ages 0-15) and senior citizens (ages 65+) were excluded since these groups were found to drink negligible amounts of tea during the study. The age group 16-65, which comprises about 55.5% of the total population, was identified as active tea drinkers (Figure 1). The highest number of tea consumers was within the age group 20-35 years (44.77%), followed by 35-45 years (28.23%), and 46-55 years (15.23%). A similar study on domestic tea consumption in India reported that those below 12 years drink negligible amounts of tea, with potential tea consumers comprising 64% of India's



Source: Boonerjee et al., 2024

Figure 6: Average cup consumption by people of different age groups



Source: Boonerjee *et al.*, 2024

Figure 7: Percentage of family and outside consumers of Bangladesh

total population (TBI, 2007). However, in the present investigation, district-wise data was calculated and analyzed for active tea drinkers, representing 55.5% of the total rural and urban population in each district. The results are presented in Table

Per-day cup consumption in Bangladesh

The average per day cup consumption by the total family members was calculated and presented in

The average tea consumption per family in rural areas was found to be 0.71 cups, while in urban areas of various districts, it was 1.11 cups. In every district examined, the rural population consumed less tea than the urban population. Daily tea consumption, both in terms of cups and quantity, was lower among rural respondents and their family members compared to their urban counterparts. According to the data collected from families, the total daily cup consumption in Bangladesh was found to be 122,619,075 cups (Table 4).

Total Cup Consumption Per-day in Tea Stalls and Other Places

Tea is widely consumed across both rural and urban areas of Bangladesh, with people enjoying it both at home and in public. Nowadays, tea stalls have become common in local gathering spots, consistently attracting tea drinkers. Observations during the study revealed varying tea-drinking habits: some individuals drink tea exclusively at home, others both at home and outside, and some only at tea stalls. It was noted that a significant portion of outside tea consumers includes working adults and males, while females and younger girls tend to drink tea at home. The survey found that 32.01% of family members consume tea outside the home, such as in offices or other locations (Figure 8). The average consumption per cup was determined based on information from canteens and restaurants. Most roadside tea stall vendors indicated that 1 kg of tea makes 450 to 500 cups. Data analysis revealed an average of 2.2 grams of tea per cup. This information was used to estimate daily cup consumption and the total annual quantity required for tea stalls and other venues (Table 5).

32.01% of tea consumers in Bangladesh drink tea outside their homes. Therefore, the total cup consumption was estimated as follows:

=29332170.24 X 0.69 Cup = 20239197 cups X 2.2 g (1kg = 400 - 450 cups)

= 44526234.42 g/ day = 45171.54 kg/ day X 365

= 16252075.41 kg/ year = 16.25 Mkg/ Year

Estimation of Surplus Tea after Consumption in Bangladesh

The survey findings indicated that Bangladesh consumed 92.15 million kilograms of tea annually. This represents 95.48% and 98.21% of the total tea production for the years 2021 (96.51 million kg) and 2022 (93.829 million kg), respectively. In this study, secondary data was analyzed to estimate the current levels of domestic consumption and export of Bangladeshi tea. According to auction reports, detailed calculations were made for internal consumption, transfers for export, and ex-garden sales, which included current season tea (CST), old season tea (OST), and unsold tea. This analysis aimed to verify the actual consumption rate and identify any surplus tea remaining in the producer-to-consumer supply chain (Table 7). The surplus tea for 2022 was calculated as follows:

Export and import data of Bangladesh Tea (M kg)

Status of tea cultivation in northern Bangladesh

Historical context

According to Newagebd (2023) reported, in 1996 on the advice of honourable Prime Minister Sheikh Hasina, the people of panchagarh to the initiative to cultivate tea in the plain lands. It was a dream of Prime Minister Sheikh Hasina, then in her first term in office. While speaking at the tea export in 2018, Sheikh Hasina mentioned the history of the tea garden in Panchagarh, said" After the Awami league came to power in 1996, when i went to Banglabandha, I saw a lot of tea gardents on the other side of the border, in India. But there was no tea garden in Bangladesh. I said that since we have the same soil, we can also cultivate here. Than i told the DC of Panchagarh to bring a sapling from there and plant it here and see if it grows in our soil" (Dhaka Tribune, 2023)

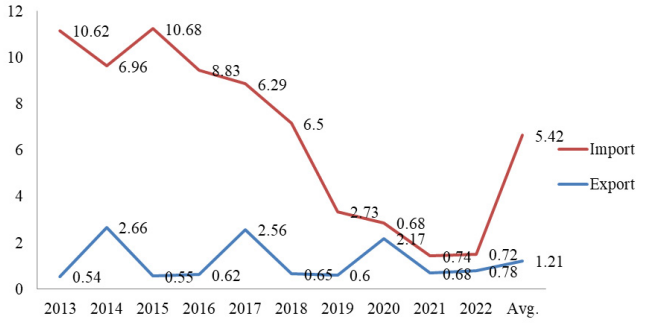
It was planned to plant tea in Panchagarh in 1999 and it was implemented in the main field plantation in 2000 (Ahmed, M., and Ahmed, T., 2015).

Tea's economic boost in northern districts

According to the Daily Prothom Alo (2023) titled "Record tea yield keeps agro-economy vibrant in northern districts" and now tea is one of the largest agro-based industries in the country (Ahmad, I., & Hossain, M. A.2013). An all-time record 17.759-million kilograms (kg) of processed tea worth Taka 2.84 billion produced in five northern districts last year kept the regional agro-economy vibrant despite

Table 5: The district-wise data was then calculated and converted for the whole country

District	Rural			Urban			Total cup/d	Total cup/d in Bangladesh
	population	cup/p/ d	cup/ population	population	cup/p/d	Cup/ population		
Mymensingh	2522842	0.49	1236192.58	749605	1.01	757101	1993293.6	127570792.3
Netrokona	1089853	0.51	555825.03	199515	0.99	197520	753344.88	48214072.32
Chattogram	2376929	0.99	2353159.71	2708958	1.3	3521645	5874805.1	375987527
Potuakhali	779907	0.51	397752.57	178454	1.02	182023	579775.65	37105641.6
Pirojpur	532046	0.59	313907.14	132785	0.97	128801	442708.59	28333349.76
Dhaka	1940011	1.0	1940011	6226938	1.1	6849632	8789642.8	562537139.2
Rajshahi	1009460	0.46	464351.6	607605	1.03	625833	1090184.8	69771824
Habigonj	1112040	1.01	1123160.4	196738	1.3	255759	1378919.8	88250867.2
Moulvibazar	1013212	1.1	1114533.2	164888	1.39	229194	1343727.5	85998561.28
Sunamgonj	1272262	0.5	636131	223091	1.01	225322	861452.91	55132986.24
Sylhet	1577306	1.2	1892767.2	561426	1.5	842139	2734906.2	175033996.8
Kustia	939352	0.5	469676	253539	0.97	245933	715608.83	45798965.12
Lalmonirhat	630664	0.65	409931.6	161783	1.02	165019	574950.26	36796816.64
Panchagarh	549377	0.6	329626.2	105345	0.95	100078	429703.95	27501052.8
Rangpur	1186319	0.50	591973.18	572420	1.02	583868	1175841.58	75253861.18
Average		0.71	1121745.73		1.11		1915924.43	122619075



Source BTB, 2022

Figure 8: Export and import data of Bangladesh Tea (M kg)

the global crises and Covid-19 pandemic. Owners of nine registered and 21 unregistered tea gardens and 8,355 small holders cultivated tea on 12,079 acres of land in these five districts and produced over 90.274-mn kgs of green tea leaves in 2022. Currently, over 30,000 people, including 18,000 women, are earning well from farm activities and plucking tea-leaves to lead a better life.

Furthermore, Tea farming expansion boosts Panchagarh economy and creates jobs, changing northern region's economy. Increased tea cultivation on plain lands and opens a new horizon in the economic development of the region also bringing solvency to many farmers as well as farm-workers improving their life standard and livelihoods (The business post 2023).

However, An average of 1,500 kilograms of green tea leaves were produced on each acre of plain land every month in Lalmonirhat district of Rangpur division to farm tea successfully on 121 acres of plain land. Since 2015, which brings delight to farmers and increase their economy and livelihoods of small growers (Daily star 2021).

Table 6: Total cup consumption of Bangladesh per day

Total cup consumption per day in Bangladesh	Cups	Total cup consumption/ day in Bangladesh
Consumption in family	12,26,19,075	14,28,58,272
Consumption in tea stalls and other places	2,02,39,197	

Source: Boonerjee et al., 2024

Source: The daily star, 2022

Figure 9: Human chain and protest rally for demanding fair price

Job opportunities

The business standard (2020) reported that Tea cultivation creates 25,000 jobs in 5 northern districts The laborers are earning Tk 500

Table 7: The month-wise old season tea auctioned in 2022

2022	*OST (000 kg)*
December	0
November	0
October	14
September	1
August	12
July	2
June	28
May	171
April	0
March	98
February	0
January	3
Total	329

Source: Statistical Bulletin, BTB 2022

Table 8: Forecasted values of tea consumption in Bangladesh at 95% confidence interval

Year of Prediction	*Forecasted Values of Tea Consumption (million kg)*		
	Forecasted Values	*Lower Confidence Limit*	*Upper Confidence Limit*
2019	94.35	87.62	101.08
2020	98.50	89.77	107.23
2021	102.65	91.84	113.46
2022	106.80	93.82	119.79
2023	110.95	95.69	126.21
2024	115.11	97.48	132.73
2025	119.26	99.17	139.34
2026	123.41	100.76	146.05
2027	127.56	102.26	152.85
2028	131.71	103.67	159.74

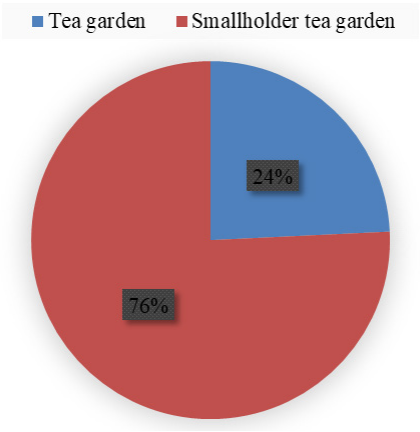
Source: Mila et al., 2022

to Tk 600 as daily wages in cash by plucking green tea-leaves in groups of 10 to 20 males and females to lead a solvent life.

Similarly, as reported by Dailyasianage (2023) "Boosting tea gardening creates 30,000 jobs in northern districts" including 18,000 women, in the tea- producing five northern districts improving their livelihoods, economy, living standard and creates job opportunities. Similar report was also reported by Bssnews (2022). "The working men and women of Panchagarh, Thakurgaon, Dinajpur, Nilphamari and Lalmonirhat districts are earning well from farm-activities in tea gardens" Said by President of Bangladesh Small Tea Garden Owners' Association Md Amirul Haque Khokan.

The price of raw tea leaves falling

Observerbd (2022) "Marginal tea growers at Tentulia deprived of fair price" Tea growers in Panchagarh district's Tentulia Upazila are suffering as the price of raw tea leaves falls during the current tea season. Despite having full gardens of tea leaves, growers are not



Source: BTB (2021)

Figure 10: Percentage of tea plantations in northern region

receiving a fair price, causing them to lose money. The current per kg raw tea leaf price is 11/12Tk/kg, compared to the previous price of 22/23Tk/kg, which growers claim is due to a syndicate of proprietors of locally grown tea factories. The growers are frustrated and demotivated as a result of this situation, and they were demanding fair price by forming a human chain for their demand (Figure 10). Tea cultivation has significantly improved the living conditions of farmers in Panchagarh district over the last decade. Tea production remained at a high level.

Moreover, The daily star (2022) described "Northern tea farming shriveled by unfair price" The tea board officials have noted that farmers are suffering and losing due to the high cost of production, low selling price, and the transportation cost of tea leaves. Additionally, factory owners were rejecting more than 20 percent of tea leaves, which is unethical, as wet leaves during the monsoon season can only be discarded up to 10 percent. The factory owners claimed that they would face losses if they did not discard "bad" tea leaves because growers harvest wet leaves all the time.

Types and Classification of tea farmers in Northern Bangladesh

A case study was conducted by Ahmed, M., & Ahmed, T. (2015) to examine tea production at northern Bangladesh and categorized into three tea as shown in table 8. Growers in northern Bangladesh based on the size of their tea land. Small growers have tea land that is less than 2 hectares, typically indicating very small, often family-run operations. Smallholders possess between 2 to 8 hectares of tea land, representing a moderate scale of cultivation that is larger than small growers but not as extensive as estates.

Tea estates have more than 8 hectares of tea land, signifying large-scale, often industrialized tea farming operations. This categorization helps to understand the varying scales and potential production capacities of tea growers in the region. Al Mamun (2019) classified tea growers in northern Bangladesh are classified into two groups according to the size of their tea farms Small-scale and tea estate (Table 9).

- **Small-scale tea growers:** These individuals own less than 25 acres of land for tea cultivation, indicating smaller and more modest tea operations.
- **Tea estate owners:** These growers possess more than 25 acres of land dedicated to tea cultivation, signifying larger and more extensive tea plantations.

Table 9: Types of tea growers in northern Bangladesh

Type of tea grower	*Belonging tea land (ha)*
Small grower	less than 2.0
Smallholder	Belonging 2 to 8
Tea estate	Belonging Above 8

Source: Ahmed & Ahmed (2015)

Table 10: Classification tea growers in northern Bangladesh

Categories	*Belonging tea land (Acre)*
Small-scale	below 25acre of land
Tea estate	More than 25 acre of land

Source: Al Mamun (2019)

This classification helps to differentiate tea growers in the region by the size of their tea land, which can be valuable for agricultural planning and policy decisions.

The annual tea cultivation area in Northern Bangladesh

In figure no 12 indicates that the annual plain land tea cultivation area in the Northern region of Bangladesh was measured in acres of land, which has shown a consistent upward trend over the years. Starting at 2,284 acres in 2009, the cultivation area has gradually increased by 2021; it reached substantial 11,434 acres (Al Mamun, 2019).

This significant growth signifies the region's increasing emphasis on tea production, with notable expansions observed between 2014 and 2018. The consistent expansion of tea cultivation reflects the region's efforts to meet the growing demand for tea and promote economic development through the tea industry in the Northern region of Bangladesh.

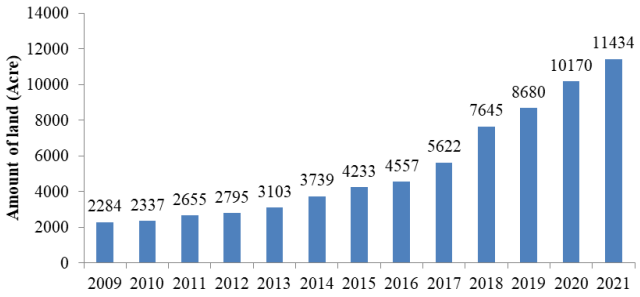
Annual plain land tea production in northern region

The annual plain tea production in the Northern region of Bangladesh, measured in lakh kilograms, has shown a substantial increase over the years. Beginning at 6.59 lakh kilograms in 2009, the production volume steadily grew. Notable growth spurts occurred between 2013 and 2016, where the production more than doubled from 14.64 lakh Kilograms to 32.06 lakh kilograms.

The upward trend continued, with a significant jump to 145.33 lakh kilograms in 2021. This remarkable growth in tea production indicates the region's increasing capacity and efforts to meet the demand for tea, contributing to the economic development and success of the tea industry in the Northern region of Bangladesh.

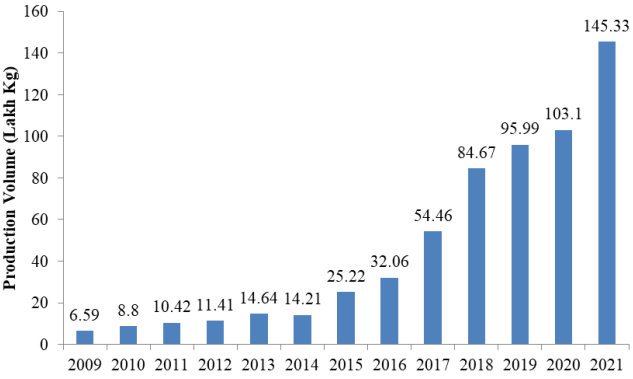
District wise amount of tea plantations in northern Bangladesh

Figure no 14 shows that District wise amount of tea plantations in northern Bangladesh, hence, In the Northern region, the district-wise distribution of tea plantations reveals varying extents of land dedicated to this crop Panchagarh stands out with a significant 9,747.8 acres, showcasing its prominence in tea cultivation. Thakurgaon follows suit with 1,370.3 acres, indicating a substantial presence. Lalmonirhat, Dinajpur, and Nilphamari have relatively smaller tea plantation areas, with 168.88, 78.37, and 68.59 acres, respectively. While each district contributes to tea production, Panchagarh and Thakurgaon exhibit a more significant emphasis



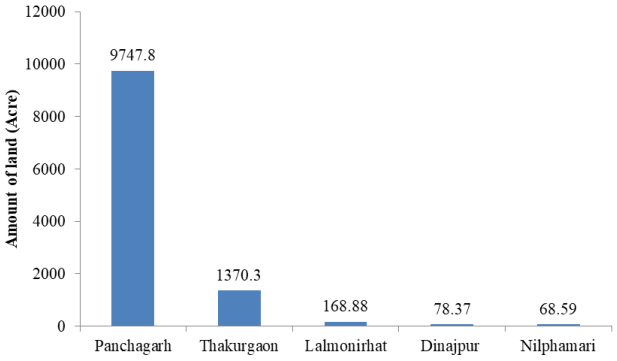
Source: Al Mamun (2019)

Figure 11: Annual plain land tea cultivation in northern Bangladesh



Source: Al Mamun (2019)

Figure 12: Annual plain land tea productions in northern region



Source: Al Mamun (2019)

Figure 13: District wise amount of tea plantations in northern Bangladesh

on tea cultivation, while Lalmonirhat, Dinajpur, and Nilphamari have relatively smaller tea plantation areas.

Tea factories operating in the northern districts of Bangladesh

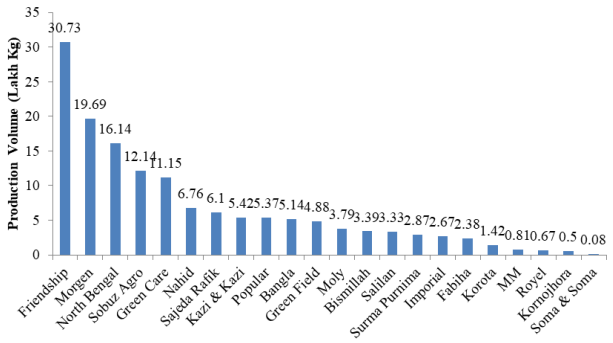
As shown in Figure no 15 among them, Friendship leads with a production volume of 30.73 lakh kilograms, followed by Morgen with 19.69 lakh kilograms and North Bengal.

With 16.14 lakh kilograms, other notable contributors include Sobuz Agro (12.14 lakh kilograms), Green Care (11.15 lakh kilograms), and Nahid (6.76 lakh kilograms) (Al Mamun, 2019). These tea estates, along with several others, collectively contribute to the

Table 11: Information on tea cultivation and production in Panchagarh district in 2021

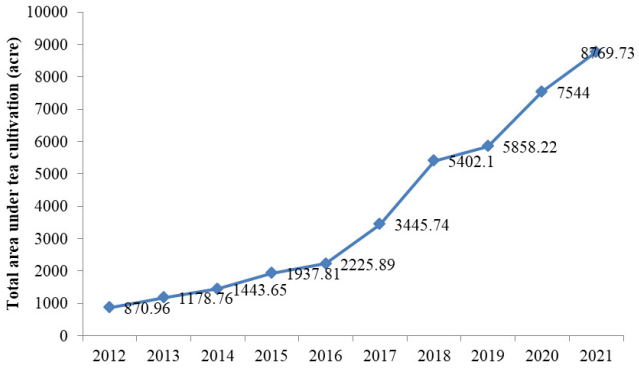
Year	*Garden class*	*Registered No*	*Unregistered No*	*Total area under tea cultivation (acres)*	*Total green tea leaves produced (kg)*	*Produced Tea (kg)*
2021	Small scale tea plantations	1,168	6,000	7,283.59	62,385,905	14,054,130
	Tea garden	08	20	2,464.21		
Total=		1,176	6,020	9,747.80	62,385,905	14,054,130

Source: Al Mamun (2019)



Source: Al Mamun (2019)

Figure 14: Tea factories operating in the northern districts of Bangladesh



Source: Al Mamun (2019)

Figure 15: Northern plains of smallholder tea plantation and production from 2012 to 2021

tea production in the Northern region, highlighting the diverse range of tea producers and their significant contributions to the tea industry in the area.

Smallholder tea plantation and production from 2012 to 2021 in Northern districts

The financial express (2020) reported that the expanding small-scale and small-holding tea gardening on plain land has become a boon for farmers to change their fortune in five

Sub-Himalayan northern districts in last one decade, Similarly Islam (2018) reported small growers and small-holders started tea plantation with small scale from the beginning of 21st century. In the early stage, it was very slow but after success it has rapidly increased.

The Northern Plains Smallholder Tea Plantation has experienced significant growth in tea cultivation over the years (Figure 16) Starting with an area of 870.96 acres in 2012, the plantation expanded steadily, reaching 1178.76 acres in 2013 and 1443.65 acres in 2014. In the years that followed, growth accelerated with the area under tea cultivation increased to 1937.81 acres in 2015, 2225.89 acres in 2016, and 3445.74 acres in 2017. The plantation saw a substantial jump in 2018, with the area reaching 5402.10 acres. The growth trend continued with 5858.22 acres in 2019 and 7544.00 acres in 2020. Finally, in 2021, the plantation achieved a significant milestone, reaching an area of 8769.73 acres.

Tea cultivation and production in Panchagarh district in 2021

The table provides information about tea cultivation and production in Panchagarh district in the year 2021, categorized by different classes of tea gardens. In 2021, tea cultivation in Panchagarh district was divided into two main categories: 'Small scale tea plantations' and 'tea gardens'.

Small Scale Tea Plantations the number of Registered Gardens were 1168 and the numbers of unregistered Gardens were 6000. Hence, Total Area under Tea Cultivation was 7283.59 acres while total Green Tea Leaves Produced was 62,385,905 kg and Produced Tea was 14,054,130 kg. On the other hand, Tea garden Number of Gardens was 8. Total Area under Tea Cultivation was 20 acres and Total Green Tea Leaves Produced was 2464.21 kg.

Overall, in Panchagarh district in 2021, there were a significant number of small scale tea plantations, contributing to a substantial production of both green tea leaves and produced tea. Additionally, there were a smaller number of larger tea gardens, but detailed production data for these gardens is not available in the table.

The total tea cultivation area for the district in 2021 was 9,747.80 acres, with a total of 62,385,905 kg of green tea leaves produced and 14,054,130 kg of tea produced.

Conclusions

Based on the findings and their logical harmonization the present paper makes the following conclusions.

- The global tea market has exhibited varied trends in production, export, and consumption. China leads in tea production, showing consistent growth from 1915 million kg in 2012 to 3181 million kg in 2022, followed by India. Conversely, Kenya and Sri Lanka have faced more fluctuations and declines. In 2023, major tea-exporting countries experienced a decline in exports, notably Kenya and Sri Lanka, while Tanzania saw an increase. Tea consumption has grown steadily, especially in China and India, driven by rising incomes and a preference for healthier beverages. However, traditional tea-importing regions like Europe and North America are seeing a decline in demand. The average tea auction prices have generally

decreased, influenced by supply-demand dynamics and currency depreciations. These trends underscore the importance of adapting cultivation and marketing strategies to navigate the evolving global tea market.

- The tea industry in Bangladesh has experienced significant growth over the past decade, with production more than doubling from 63.88 million kg in 2014 to 102.92 million kg in 2023. This growth is attributed to improved cultivation practices and favorable climatic conditions, particularly in regions like Sylhet. Despite some fluctuations due to external factors such as the COVID-19 pandemic, the industry has shown resilience and a strong recovery. Domestic consumption has also risen, driven by increasing urban demand. With continued innovation and investment, the Bangladesh tea industry is well-positioned to sustain its growth and enhance its contribution to the national economy.
- Tea cultivation in northern Bangladesh, particularly in Panchagarh, has significantly boosted the local economy and created numerous jobs. Initiated in 1996 by Prime Minister Sheikh Hasina, the industry now produces millions of kilograms of tea annually, involving thousands of smallholders and workers. In 2022, over 17.759 million kilograms of processed tea were produced, contributing Taka 2.84 billion to the economy. The industry has created jobs for over 30,000 people, including 18,000 women, enhancing livelihoods. However, challenges like falling raw tea leaf prices and unfair practices by factory owners persist. Despite these issues, tea farming continues to promote economic development and improve living standards in the region.

References

1. Ahammed, K. M. 2012. Investment for Sustainable Development of Bangladesh Tea Industry - An Empirical Study. available at http://bea-bd.org/site/images/pdf/9.pdf
2. Ahmad. I. & Hossain, M. A. (2013). Present status of Bangladesh tea sector in respect of world tea: an overview, J. Appl. Sci. Technol, 9(1), 116-128.
3. Ahmad. I. & Hossain, M. A. (2013). Present status of Bangladesh tea sector in respect of world tea: an overview, J. Appl. Sci. Technol, 9(1), 116-128.
4. Ahmed M, Ahmed T (2015) A case study on tea production at northern Bangladesh. Tea J Bangladesh 44:10–18
5. Ahmed, M., & Ahmed, T. (2015). A case study on tea production at northern Bangladesh. Tea Journal of Bangladesh, 34.
6. Ahmed, M., & Sadiq, M. (2022). Economic and socio-economic impacts of tea cultivation in Bangladesh. *Journal of Agricultural Economics and Development*, 4(1), 25-36.
7. Alam, A. F. M. (2002, July). Research on varietal improvement of tea and their utilization in the tea industry of Bangladesh. In *Proceedings of the International Seminar on "Varietal development of Tea in Bangladesh* (Vol. 13, pp. 7-26).
8. Ali M, Islam M, Saha N, Kanan AH (2014) Effects of microclimatic parameters on tea leaf production in different tea estates in Bangladesh. World J Agric Sci 10:134–140
9. Ali M, Uddin M, Mobin M, Saha N (2015) Effects of microclimatic parameter on tea leaf production in different tea estates, Bangladesh. J Environ Sci Nat Resour 7(1):183–188. https:// doi.org/10.3329/jesnr.v7i1.22168
10. Anonymous. 2015. Statistics on Bangladesh Tea Industry, December-2015. Project Development Unit, Bangladesh Tea Board, Srimangal, Moulvibazar.
11. Arancon, N. Q. Edwards, C. A.. Dick. R., & Dick. L. (2007). Vermicompost tea production and plant growth impacts. Biocycle, 48(11), 51.
12. Bangladesh Tea Board. (2020). *Bangladesh Tea Industry Overview*. Retrieved from http://www.teaboard.gov.bd/
13. Basu MA, Bera B, Rajan A. (2010). Tea Statistics: Global Scenario. Inc. J. Tea Sci, 8 (1): 121-124.
14. Boonerjee, S., Islam, M. A., Islam, S. M., Paul, S. K., Uddin, M. T., & Alamgir, M. S. (2014). Consumption and Export Potential of Tea in Bangladesh: A Field Study. Shah, Consumption and Export Potential of Tea in Bangladesh: A Field Study.
15. Bssnews, (2022). Tea farming creates jobs, changing northern region's economy. Retrieved from: https://www.bssnews.net/agriculture-news/53037
16. BTB, Annual Statistical Bulletin, (2022). Bangladesh Tea Board, 171-172, Baijid Bostami Road, Nasirabad, Chottagram.
17. BTB. (2015). Statistics on Bangladesh Tea Industry – 2015. Project Development Unit, Bangladesh Tea Board, Srimangal, Moulvibazar.
18. BTRI: Bangladesh Tea Research Institute (2020). BTRI, Annual, Report-2020.
19. Carr, M. K. V., & Stephens, W. (1992). Climate, weather and the yield of tea. In *Tea: Cultivation to consumption* (pp. 87-135). Dordrecht: Springer Netherlands.
20. Cesareo, L., & McMullen, J. S. (2023). The sustainability imperative: Trends in the global tea industry. *Journal of Sustainable Development*, 15(2), 45-58.
21. Cheruiyot EK, Mumera LM, Ng'Etich WK, Hassanali A, Wachira F (2010) High fertilizer rates increase susceptibility of tea to water stress. J Plant Nutrition 33:115–129
22. Chomchalow N (1996) Herbal tea, an Editorial. NANMAP-17, February 1996, FAO/RAP, Bangkok, Thailand
23. Daily star, (2021). Tea cultivation in plain land brings delight to farmers. Retrived from: https://www.thedailystar.net/business/economy/news/tea-cultivation-plain-land-brings-delight-farmers-2176166
24. Dailyasianage, (2023). Boosting tea gardening creates 30,000 jobs in northern districts. Retrieved from: https://dailyasianage.com/news/301852/boosting-tea-gardening-creates-30000-jobs-in-northern-districts
25. Dhaka Tribune, (2023). Bangladesh's 3rd tea auction centre to open in Panchagarh. Retrieved from: https://www.dhakatribune.com/bangladesh/320085/bangladesh%E2%80%99s-3rd-tea-auction-centre-to-open-in
26. Euromonitor International. (2022). *Tea: A Global Market Overview*. London, UK: Euromonitor International.
27. FAO. (2020). *FAOSTAT: Food and Agriculture Data*. Retrieved from http://www.fao.org/faostat/en/
28. Islam, M. S., et al. (2021). Enhancing the productivity of tea cultivation in Bangladesh: Innovations and challenges. *Journal of Agriculture and Rural Development*, 7(2), 112-125.
29. Jain, S., & Jain, P. (2021). Global tea market: Trends and forecasts. *Beverage Research*, 12(3), 78-91.
30. Mamun MSA (2011a) Integrated approaches to tea pest management in South India: a way of sustainable tea cultivation. LAP LAMBERT Academic Publishing GmbH & Co. KG Dudweiler Landstr. 99, 66123 Saarbrücken, Germany, p 59. ISBN: 978–3–8465–5088–5
31. Mamun MSA (2011b) Development of tea science and tea industry in Bangladesh and advances of plant extracts in tea pest management. Int J Sustain Agril Tech 7(5):40–46
32. Mamun MSA, Ahmed M (2011) Integrated pest management in tea: prospects and future strategies in Bangladesh. J Plant Prot Sci 3(2):1–13
33. Mamun, M. S. A. (2019). The tea industry of the plains. Book, Shamima Nasreen Happy 5/30, Ghatail North Para, Ghatail.
34. Manik, M. H. (2024). Demographic and Socio-economic Changes in Bangladesh: Evidence from the Population Census in 2022. *Formosa Journal of Sustainable Research*, *3*(1), 29-38.
35. Mila, F., Nahar, A., Acharjee, D., Parvin, T., & Culas, R. (2022). Modelling and forecasting of tea production, consumption and export in Bangladesh. Current Applied Science and Technology, 22(2), 1-20.
36. Newagebd, (2023). Bangladesh's 3rd tea auction centre to open in Panchagarh in a month. Retrieved from: https://www.newagebd.net/article/206278/bangladeshs-3rd-tea-auction-centre-to-open-in-panchagarh-in-a-month
37. Observerbd, (2022). Marginal tea growers at Tentulia deprived of fair price. Retrieved from: https://www.observerbd.com/news.php?id=366877

38. Pressxpress, (2023). Tea Waves: Bangladesh Surpasses 2023 Records!. Retrieved from: https://pressxpress.org/2024/01/22/tea-waves-bangladesh-surpasses-2023-records/#:~:text=Bangladesh%20achieved%20a%20milestone%20in,those%20involved%20in%20the%20industry.
39. Prothom Alo, (2023). Record tea yield keeps agro-economy vibrant in northern districts. Retrieved from: https://en.prothomalo.com/business/local/uggrmeioyr#:~:text=Record%20tea%20yield%20keeps%20agro%2Deconomy%20vibrant%20in%20northern%20districts,-BSS&text=An%20all%2Dtime%20record%2017.759,crises%20and%20Covid%2D19%20pandemic
40. Rahman MM, Islam MN, Hossain MR, Ali MA (2017) Statistical association between temperature-rainfall and tea yield at Sylhet Malnicherra tea estate: an empirical analysis
41. Rahman, M. A. (2019). History of tea in Bangladesh: A colonial legacy. *International Journal of Tea Science*, 5(1), 10-22.
42. Raliman, A. Jianchao, L., Adnan, K. M., Islam, M. D. I., Zhao, M., & Sarker, S. A. (2020). How indebted farmers perceive and address financial risk in environmentally degraded areas in Bangladesh, *Environmental Science and Pollution Research,* 27(7), 7439-7452.
43. TBI. (2007). Study report: Executive summary of study on domestic consumption of tea in India Tea Board of India, 14 BTM Sarani (Brabourne Road), Kolkata 7000 001.
44. The business post, (2023). Tea farming expansion boosts Panchagarh economy. Retrieved from: https://businesspostbd.com/nation/tea-farming-expansion-boosts-panchagarh-economy-2023-02-23
45. The business standard, (2020). Tea cultivation creates 25,000 jobs in 5 northern districts. Retrieved from: https://www.tbsnews.net/economy/agriculture/tea-cultivation-creates-25000-jobs-5-northern-districts-170320
46. The daily star, (2022). Northern tea farming shriveled by unfair price. Retrieved from: https://www.thedailystar.net/opinion/views/news/northern-tea-farming-shrivelled-unfair-prices-3159706
47. Vihaba (2022) ideal climate condition for tea cultivation retrieved from https://vihaba.global/2022/02/17/what-is-the-ideal-climate-condition-for-tea-cultivation/