

A Critical Review of the Tea Board's Tea Research Management in India

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ABSTRACT:

Tea is India's national pride and heritage. Tea has a special significance in India, where it has been a leading industry for the last century and has been an integral part of the country's economic development. As a regulatory body for the tea industry, the Tea Board of India has been providing funds for R&D activities and facilitating tea research in the country to increase tea production and improve quality. Tea research management is primarily coordinated by the Tea Board through major tea research organisations - TRA Tocklai TRI for north India, UPASI TRI for south India, the Tea Board's own DTR&DC, Kurseong for the Darjeeling tea sector, and a few other research institutes/universities on project modes. The Tea Board's mandates on tea research and development functions are critical to the growth and sustainability of the Indian tea industry. The author of this article examines the Tea Board's management of tea research and development functions in India.

KEYWORDS: Tea Research, Tea Industry, Tea Board, Research Management, Innovation

I. INTRODUCTION:

The tea industry in India is about 200 years old, the second-largest producer of the finest quality tea globally with a significant presence in the domestic and international markets, and one of the largest tea consumers. The Indian tea industry

is the single largest industry that supports the nation's economy and provides direct employment to about 11 Lakh workers in remote rural areas while creating millions of employment opportunities in tea auctions, warehousing, packaging, transportation, retailing, ancillary industries, and suppliers. The total turnover of the Indian tea industry is around Rs. 50,000 Crores (Anonymous, 2020). The tea industry has played a constructive role in preserving the favourable environment by absorbing carbon dioxide from the environment. In India, tea is grown mainly in Assam, West Bengal, Tamil Nadu, Kerala, Karnataka, Tripura, Himachal Pradesh, Uttarakhand, Bihar, and a few other states. The major tea growing states Assam, West Bengal, Tamil Nadu and Kerala contribute 97.48% of the total tea production. In the organised sector, there are 1569 tea estates and 923 manufacturing units. The organized sector share of production is 50.76%, whereas small growers' share of production is 49.24% during the year 2019-2020. Small growers' contribution to total tea production is increasing year to year. India produces a variety of finest quality Orthodox tea, CTC Black tea and Green tea. The aromatic and flavoured Darjeeling tea, the strong Assam CTC and Orthodox tea, Nilgiri tea is unique globally. During the year 2019-2020, out of the total tea production, CTC contributes 89% while Orthodox and Green Tea at 11% (Tea Board of India, 2020).

Table 1: World Production and Supply of Tea

Year	World Production	Global Consumption	Excess or Shortage
2014	5209	4889	320
2015	5285	5035	250
2016	5594	5284	290
2017	5719	5496	202
2018	5966	5677	220

2019	6150	5894	256
2020	6013	5819	194

(Source: Tea Board of India, 2020)

India produces approximately 22% of the world's tea. Tea is grown over 6,36,557 hectares (ha) in India, accounting for 16% of the world's total tea growing area (source: Tea Board of India, 2020). Since independence, tea production has

increased by almost 65 %, while the land area has increased by 40%. In 2020, as a result of the Covid-19 pandemic, India produced 1257.53 million kgs of tea, 132.18 million kgs fewer than the previous year.

Table 2: Indian Tea Production, Area, Yield from 1985 - 2020

Year of Production	Production in M. Kgs	Tea Area in Ha.	Yield in Kgs/Ha
1985	656.16	399,966	1,641
1990	720.34	416,269	1,730
1995	756.02	427,065	1,770
2000	846.92	504,366	1,679
2005	945.97	555,611	1,703
2010	966.40	579,353	1,668
2011	1115.72	579,353	1,925
2012	1126.33	563,979	1,997
2013	1200.04	563,979	2,127
2014	1207.31	563,979	2,141
2015	1208.66	563,980	2,143
2016	1267.36	566,660	2,236
2017	1321.76	566,660	2,332
2018	1338.63	636,557	2,103
2019	1389.71	636,557	2,183
2020	1257.53	636,557	1,976

(Source: Tea Board of India, 2020)

The tea business in India is one of the country's key foreign exchange earners, and it also contributes significantly to employment creation due to the industry's high labour-intensive nature. The Indian tea business is the largest and most lucrative private-sector employment in the rural sector, employing more than a million people. The

Indian tea market is estimated to be worth around 10,000 Crores, with approximately 90 per cent occurring in the domestic market. India is the fourth-largest tea exporter in the world in 2020, with an export shipment of approximately 208 million kg of tea (Anonymous, 2020).

Table 3: Total Production, Export, Import, Consumption of tea in India
Year 2000 - 2020 (in M. Kgs)

Year	Production	Export	Import	Domestic Consumption	Excess or Shortage
2000	847	207	13	653	0
2005	946	199	17	757	7
2010	966	193	20	837	-44
2014	1207	207	21	927	93
2015	1209	229	19	948	51
2016	1267	222	21	965	101
2017	1322	252	21	1059	32

2018	1339	256	25	1084	23
2019	1390	252	16	1109	44
2020	1258	208	24	1135	-61

(Source: Tea Board of India, 2020)

Indian tea market is huge with a large number of local and regional players. India dominates the world's tea trade having the largest tea producers like McLeod Russell India Ltd, Amalgamated Plantations, Goodricke Group, Assam Co Ltd., Jay Shree Tea & Industries Ltd, and others. The major tea exporters of India include Hindustan Unilever Ltd, McLeod Russell India, Girnar Food & Beverages Pvt Ltd, J V Gokal & Co, Tata Global Beverages Ltd, JFK International Ltd, and Assam Co Ltd. Some of the critical elements of India's competitiveness in the tea sector include strong geographical indications, considerable investments in tea processing units, continuous innovations and research, augmented product mix, and strategic expansion (Tea Board of India, 2020).

India has the world's most extensive organised production base in tea. The Indian tea industry has a pool of experience and talent unmatched by any other country. It has highly competent tea research institutions closely related to the tea industry and a large pool of tea workers. These various components of the Indian tea industry make tea the most important crop in the nation's economy as an export commodity, employment generation, a contributor to State and Central revenue, and as the source of an essential beverage for widespread consumption.

Indian Tea industry made a long journey since its beginning. India produced 275 million kg of tea in 1950, which increased to 1257 million kg during 2020 registering a growth of 457% in production during the last 70 years. Similarly, the plantation area increased from 3.15 Lakh ha in 1950 to 6.36 Lakh ha in 2020 (201% increase). Productivity of tea for the same period increased from 873 kg/ha (in 1950) to 1976 kg/ha (in 2020). This significant growth and development of the Indian tea industry were possible largely due to effective tea research and innovations in the tea research institutes, mainly TRA Tocklai and UPASI TRI, in the form of high yielding planting materials, agro-technology packages, shade management, pest & disease management, drainage improvement, young tea management, nutrition management, weed management and its successful adaption and implementation in the tea sectors in India.

II. IMPORTANCE OF TEA RESEARCH IN INDIA:

Any industry, including the Indian tea industry, is built on research. According to the Government of India's objectives and policies, tea is a significant export commodity with a great potential for contributing to national income, job creation, and environmental protection. The Indian tea industry has benefited significantly from the well-established research and development infrastructure at the TRA Tocklai Tea Research Institute in Jorhat, Assam, the UPASI Tea Research Institute in Valparai, Tamil Nadu, the Darjeeling Tea Research & Development Centre in Kurseong, West Bengal, the Institute of Himalayan Bioresource Technology in Palampur, the National Tea Research Foundation in Kolkata, the Assam Agricultural University in Jorhat, and IIT Kharag (Tea Board of India, 2020).

In India, tea research is primarily supported through grants-in-aid and levies on the tea industry. Through the Tea Board of India, the Indian government contributes substantial amounts of funds for the management of tea research and development. Apart from conducting basic and regulatory research in research institutions and universities, the Tea Board promotes tea research for applied aspects (field-oriented, demand-driven). Additional studies are conducted on socioeconomic aspects of tea, packaging, ergonomics of tea, and worker health. The objectives of tea research in India are as follows:

- 1) Increase in productivity per unit area as well as total production
- 2) Improvement and maintenance of the quality of finished products until it reaches the consumers within and outside the country
- 3) Mechanising and streamlining of Manufacturing technology
- 4) Diversification of products for health beverages, value-added products
- 5) Utilisation of tea waste for industrial use
- 6) Transferring technology speedily
- 7) Anticipate future challenges and to ready for suitable solutions
- 8) Mitigation of climate change challenges

Tea research findings also have a significant impact on the national economy by increasing tea production, productivity, and quality.

The conditions under which tea is grown are not static, but rather constantly changing. The use of fertilisers, power and fuel, pesticides, herbicides, availability, and labour conditions are all changing as a result of changes in weather patterns, rainfall, and drought. As a result of the consistent increase in research contribution over the years, tea research and development has remained dynamic.

India's prospects for tea plantations are promising if the country's challenges are met with scientific research and development. To overcome the challenges of scientific research and innovation, the Indian tea industry must develop several initiatives. The government of India, through the Tea Board India, promotes tea plantation development, quality up-gradation and product diversification, market promotion, extensive tea research and development, the welfare of tea garden workers, the development of small tea growers, and a tea regulation programme for the overall protection, growth, and sustenance of Indian tea. The aforementioned components primarily consist of extending the subsidy/financial incentives/grants-in-aid for improving Indian tea production, productivity, and quality, as well as extensive tea research and development to meet future challenges.

III. INITIATIVE AND EXPANSION OF TEA RESEARCH IN INDIA:

The beginning of scientific research and investigations on newly discovered tea plants in Assam began nearly two centuries ago, much before the beginning of agricultural research in India. By appointing Tea Superintendents, the colonial government began cultivating tea plantations in experimental plots and preserved Assam's natural tea forests in the early 1830s. Since the 1840s, the Government of India has actively supported scientific investigations of tea plants and initiated organised tea research, including financial support and the participation of Government scientists or experts in various scientific experiments, deputations, and studies (Mann, H 1918). Such scientific studies laid the groundwork for basic research on tea and its agricultural practises in the decades that followed. With the establishment of the Indian Tea Association's (ITA) scientific laboratory in Kolkata in 1898, a new era of organised tea research began. In 1900, the Indian Tea Association appointed Dr. H. H. Mann as Scientific Officer to work in the laboratory and conduct fundamental research on all aspects of tea and its agricultural practices. Following that, in 1904, the Indian Tea Association established a small entomological laboratory at Kannykoorie,

near Silchar town in Assam's Cachar district, to study tea pest infestations in Assam's southern tea plantations, Tripura, and present-day Bangladesh (Tea Research Association, 2020).

Another chemical laboratory was established in 1904 at Heeleakah Tea Estate near Mariani, Assam, for scientific investigations on soils, fertilisers, and manures for tea plantations in upper Assam's Brahmaputra valley, which was the hub of tea plantations at the time. The British colonial government initiated the establishment of a permanent tea research centre, complete with laboratories and field infrastructure, in the heart of Assam's tea growing areas. With financial support from the colonial governments of India, Bengal, and Assam, the Indian Tea Association established Tocklai Experimental Station (now known as Tocklai Tea Research Institute) near Jorhat, which began operations on September 25, 1911 as the world's most extensive and only tea research institute. Tocklai TRI and its outstations in the tea districts of north India conducted pioneering research on all aspects of tea cultivation, agricultural, and manufacturing processes to support the exponential growth of the Indian tea industry, which was also expanded to other countries around the world. The Tocklai TRI contributed to the overall improvement of tea culture and manufacturing through improved methods of soil cultivation, pruning, shading, drainage, manuring, and tea manufacturing. For more than a century, Tocklai TRI disseminated scientific findings, technology, improved agricultural practices, and innovations through regular lecture courses, seminars, workshops, meetings, on-the-spot field demonstrations, regular visits to tea estates, and scientific reports, booklets, and leaflets.

From 25 September 1911 to 31 December 1963, Tocklai TRI and its outstations served as the Scientific Department of the Indian Tea Association, with considerable financial support from the governments. Tea Research Association, a registered scientific research society, took over management of Tocklai TRI and its outstations from 1st January 1964 to 31st March 1990, with substantial financial support and scientific guidance from the Council of Scientific & Industrial Research (CSIR) and Tea Board of India. Following the withdrawal of the CSIR from the Adhoc arrangement with the Tea Research Association for the research management of Tocklai TRI and its outstations, on 1 April 1990, the Ministry of Commerce & Industry, Government of India, began funding the institute with a significant share of capital as grants-in-aid through the Tea

Board of India. Tea Research Association is funded in part by annual membership subscriptions from member tea gardens and financial grants from various government agencies for research projects (Tea Research Association, 2020).

Similarly, tea research in south India was initiated in the late nineteenth century by the United Planters' Association of Southern India (UPASI) with government support in 1925. In 1926, Dr. W.S. Shaw was appointed as the first Scientific Officer, and a Tea Experimental Station with laboratories and experimental plots was established at Davershola. To meet the growing demand for tea research and development to assist tea planters in south India, the Tea Research Station was relocated from Devarshola to Valparai in the mid-1950s. Following India's independence, the Tea Board of India recognised the UPASI Tea Research Station's research activities and provided financial support in the form of capital grants. In 1999, UPASI established the Tea Research Foundation (TRF) to improve the management of scientific research on tea cultivation, production, and processing, as well as other related topics. Since 1990, UPASI TRI has received significant funding from the Ministry of Commerce and Industries, Government of India, via the Tea Board of India. Membership subscriptions and financial grants from various government agencies for time-bound research projects contribute to some of the revenue (UPASI TRI, 2020).

IV. POST INDEPENDENCE INITIATIVES OF THE GOVERNMENT OF INDIA:

After the independence of India in 1947, the Government of India recognised the tea industry as one of the major industries which provides one of the country's most essential commodities for export, hence emphasised boosting the Indian tea industry with several schemes through five years plans. However, there has been a crisis in the tea industry with a substantial decline in the volume of tea production, productivity, quality and exports in the 1950s, and the government was concerned about such a crisis in the tea sector. To examine the various problems affecting the Indian tea industry as a whole, and suggest remedial measures, the Government of India had appointed an Adhoc Committee by resolution no. 236(3) F.T. (Tea)/49 dated 12th February 1949. The Committee submitted the report on 11th August 1950 with specific recommendations for the betterment of the Indian tea industry and its sustainability. The Adhoc Committee noted that the scientific innovations and

advice from Tocklai TRI were limited to the Indian Tea Association members' only, mostly in the organised tea sectors. However, such technological innovations and scientific advances were more important for small and unorganised tea gardens to make a valuable contribution to the Indian tea industry. The Adhoc Committee emphasised more expansion of scientific studies of the various aspects of culture and manufacturing of tea with innovations. The Committee recommended the expansion of Tocklai TRI with financial grants from the government of India. (The Report of the Adhoc Committee on Tea, 1950, Government of India, pages 47-48).

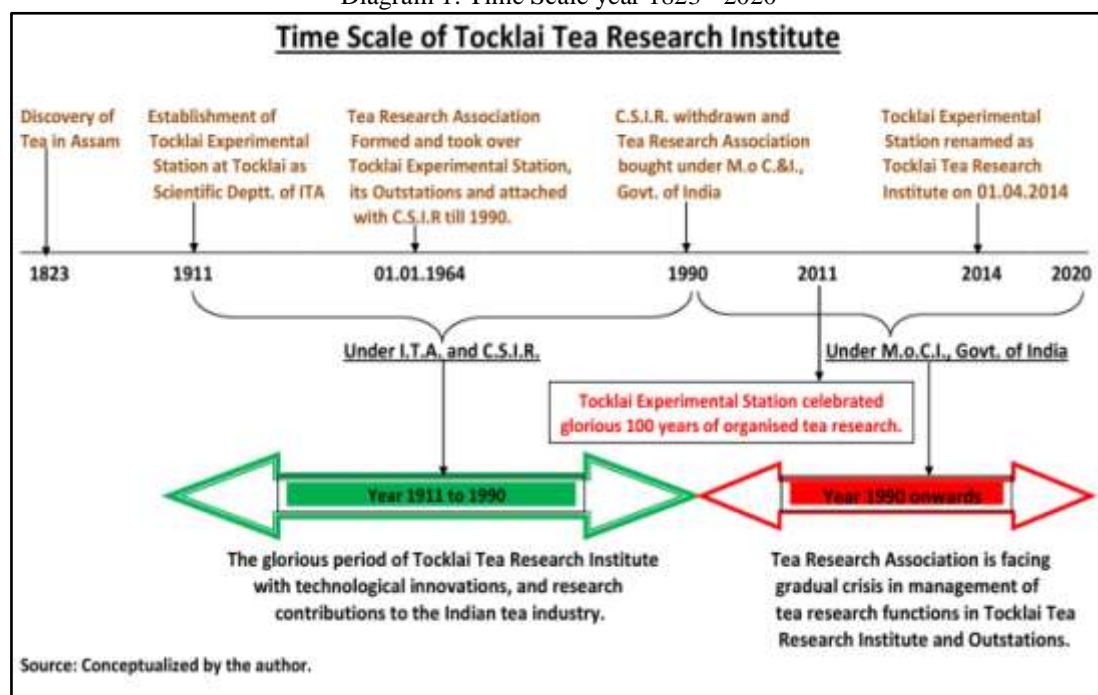
The Indian Tea Association also faced difficulties in the 1950s in managing the tea research activities at Tocklai TRI and its outstations due to the decline of its membership. After the independence of India, many tea companies registered in London experienced a changeover from British to Indian hands, few tea companies experienced bankruptcy. During that period, industrial relations were deteriorated in the wake of the trade union movement, particularly in the Bengal region. The disruption of river route cargo movement and train transportation routes through East Pakistan (now Bangladesh) added more difficulties to the tea sector. The two world wars had also forced human costs on the tea sectors as many tea garden managers who were deputed to military duties had either died or wounded or retired. Owing to such an adverse situation, the Indian Tea Association approached the new government of India for financial aid and supports for managing the tea research activities at Tocklai TRI and its outstations (ITA General Committee Report, 1905-1960). The government of India agreed to facilitate substantial financial support for the management of tea research activities both in Tocklai TRI and UPASI TRI and advised to form a separate scientific research organisation similar to ICAR or CSIR so that the tea research facilities and technological deliverables would be shared to all stakeholders of the Indian tea industry.

As per the directives of the Government of India, a non-profit scientific research organisation "Tea Research Association" was formed and registered under the Societies Registration Act, 1961 at Kolkata, which took over the management of Tocklai TRI and its outstations from 1st January 1964 (Reference to TRA Memorandum of Association with Registration Certificate). The Tea Research Association was attached with the Council of Scientific & Industrial Research (CSIR) and was classified as a scientific research organisation for which the union

government accorded various recognitions. CSIR had been funding to Tea Research Association, evaluating and monitoring the research functioning till 1990. The formation of the Tea Research Association in 1964 with Tocklai at the centre of

all activities further expanded the horizon of tea research to cover all gardens in North East India irrespective of their membership with any producer Association (Barbora, B C, 1992).

Diagram 1: Time Scale year 1823 - 2020



Source: Conceptualized by the author.

In 1990, the Union Ministry of Commerce & Industry started providing financial grants-in-aid and monitoring the research functioning of the Tea Research Association through the Tea Board of India. Tea Research Association is an autonomous quasi-government scientific research organisation for the tea research management at the Tocklai TRI and its outstations across tea districts of north India. Tocklai TRI did path-breaking fundamental and applied research on all aspects of tea since its inception. The institute delivered technological breakthroughs to the tea plantations adopted worldwide, and many first inventions on tea research were credited to the institute. Other tea research institutes in the world established afterwards took the fundamental research base from the Tocklai TRI. In recent years, the tea research institutes of Sri Lanka, Kenya, Japan and China are putting greater efforts into quality tea research with the extensive support and management of their respective governments.

India dominates organised research on tea in the last 110 years. The Indian tea industry has benefited immensely from the well-established research management and developed infrastructure

in Tocklai TRI, Jorhat, Assam, UPASI TRI, Valparai, Tamil Nadu. Few other institutes like Darjeeling Tea Research & Development Centre in Kurseong, West Bengal of Tea Board of India, CSIR Institute of Himalayan Bioresource Technology in Palampur, Assam Agricultural University, Jorhat, IIT Kharagpur are also actively engaged in tea research and development for delivering the newest technologies and innovations. Tea Board of India also sponsors research projects to Himachal Pradesh Agricultural University, the State of Uttaranchal for imparting technical support to the tea growers.

V. TEA BOARD OF INDIA - ITS ROLE ON TEA RESEARCH MANAGEMENT:

The Tea Board of India was founded in 1954 as a statutory organisation under the Ministry of Commerce and Industry, Government of India, under section 4 of the Tea Act, 1953. Regulatory, developmental, research and development, marketing, and promotional activities are all part of the Tea Board's responsibilities. Despite the Tea Board of India's promotion of various regulatory

and other functions for the improvement and sustainability of the tea sector over the last seven decades, declining tea productivity and production, a comparative decline in Indian tea prices, gradual increases in production costs, loss of export share in the international market, and declining technological innovations and research deliverables of various tea research institutes in India have all been observed. Despite a large domestic tea market and the opportunity to create a domestic source of growth, the Indian tea industry reflects a grim scenario.

The phenomenal growth of new technology in recent years has shifted the production scope, posing new challenges for the tea sector. To address the research challenges, the Tea Board of India must emphasise adequate research funding and a monitoring system. The Tea Board is providing financial grants-in-aid to the Tea Research Association for the management of tea research functioning at Tocklai TRI, and the UPASI TRI under specific schemes both for capital and recurring expenditure so that both the research institutes can deliver scientific and technical support to the tea industry. TRA Tocklai and UPASI TRI are conducting research for developing field technologies, information for quality manufacture of tea, plant protection measures including pesticide residue, project diversification and transfer of technology in the entire north and south India. Technical information on quality, residue, packaging, application of international standards on hygiene requirements are all taken up with the tea industry for the export of tea. Both applied and basic research is carried out in those tea research institutes on the following focus areas – (i) Integrated tea agronomy and soil-water management program for the development of package and practices for sustainable tea production, (ii) Integrated tea improvement program for the development of superior planting materials capable of giving more cuppage than all existing planting materials having yield and quality potential and resistant to biotic & abiotic stress, (iii) Integrated tea protection program for the development of bio-pesticides against major pests and diseases of tea and development of package and practices for pest and disease management using physical and cultural methods, (iv) Integrated tea mechanization program for the development of machines/agricultural appliances required for Pruning, Plucking, Fertilizer application, Uprooting etc. and studies on conservation and efficient use of energy in factory operations, (v) Integrated tea quality improvement program for the standardization of factory operations in order to

ensure the retention of quality of finished product, (vi) Integrated tea based product diversification program for the development of tea based non edible products (cosmetics, tea oil, medicine etc.) having high end market value, (viii) Integrated program on climate change and tea for assessing the impact of climate change on tea and development of strategies to mitigate them (Tea Board of India, 2020).

The Government of India, the Tea Board, and all stakeholders in the Indian tea sector have high expectations for Tocklai TRI, UPASI TRI mainly, and other tea research institutes to conduct high-quality tea research and technological breakthroughs. However, these institutes have been gradually deteriorating in terms of financial viability and human resource depletion for the last three decades without receiving adequate attention from the relevant government authorities. As a result, the institutes' research and innovation output fall short of the expatiations in comparison to previous decades. "The research activities of Tea Board of India were not fruitful as neither any deliverables were transferred for the use of the tea industry nor were any patents filed. The Tea Board failed to adequately support research activities by not providing sufficient funds, or the adequate number of staff, nor in ensuring the completion of research projects. No controls were put in place to evaluate and monitor research activities undertaken by external entities supported by Tea Board" as reported in CAG Audit Report on Performance of Tea Board, 2010-2011.

Unlike the country's agriculture sector, India's tea industry has seen little innovation in research and technology during the last few decades. This may reflect the Tea Board's poor performance in managing capital resources allocated by the Union Ministry of Commerce and Industry for tea research management, particularly towards Tea Research Association (i.e. for Tocklai TRI) and UPASI TRI, resulting in the ineffectiveness of tea research activities and the gradual financial constraints of the two reputable tea research institutes. This demonstrates the Tea Board of India's ineffectiveness and poor management of tea research and development functions.

It is critical to change the ways in which tea research is managed in India. Despite the multiple obstacles it encounters, India's tea sector spends just around one-third of what it does at the national level on research and development. Tea research institutes are currently almost totally reliant on government support, while the tea industry's capital commitment to R&D is at a bare

minimum. The Tea Board's research funds have been cut by the Indian union government, putting tea research organisations in an unprecedented financial crisis. Furthermore, the government's unreasonable delays in releasing approved research funds added to the research institutes' challenges. For example, the Tea Research Association, the managing the Tocklai TRI, is funded substantially by the Ministry of Commerce & Industry, Govt. of India through Tea Board on various heads changing from time to time. The tea industry also contributes through annual membership subscriptions. Sometimes, the fund allocation requires multi-institutional participation in tea research with other institutions or universities. This reflects the need to increase R&D allocation of funds which will boost in realising the research deliverables of tea research institutes. The absence of steady and assured funding for tea research would undermine the ability of the tea sector in India (Hazara N, 2020).

In the last three decades, the glorious tea research activities of Tocklai TRI and UPASI TRI have experienced a downward trend, which can be attributed primarily to inappropriate and untimely provisioning of tea research funds and diversion of allocated research funds by the concerned government authorities. Even the Tea Board of India struggled to manage its tea research institutes DTR&DC, Kurseong, and the Quality Control Laboratory (QCL) in Siliguri. The consequences of such tea research management apathy in India are poor labour standards or poor human development in the Indian tea sector. As a case study, we examine the Tea Research Association's current crisis in research management for its tea research operations at Tocklai TRI and its outstations throughout north India.

VI. THE CRISIS IN TEA RESEARCH ASSOCIATION:

The Tea Research Association, which manages Tocklai TRI and its outstations, has gradually received insufficient, late financial grants and scientific monitoring from the government. Tocklai's importance, leadership in tea R&D, and innovations over the last century have not been adequately recognised, and there is no full-proof system of funding from the Ministry of Commerce & Industry or the Tea Board of India. Since 1990, the release of approved funds to the Tea Research Association for the management of tea research and innovation has been erratic. As a result, the Tea Research Association's research management is severely harmed, and the problem has gotten worse since the start of the 12th Plan period. The Tea Research Association accumulated payable dues as

a result of the Ministry of Commerce and Tea Board of India's annual funding shortfall.

From 1964 to 1990, the Tea Research Association received C.S.I.R. grants on 50% of net recurring expenditure and 33% of net capital expenditure, along with tea industry contributions in the form of annual membership subscriptions. On the clearance of annual membership subscriptions of Tea Research Association and UPASI TRI, Indian tea companies benefited from financial subsidies under various subsidy schemes of the Tea Board of India. The applicant must be a member of the Tea Research Association (for gardens in North India) and UPASI TRI (for gardens in South India) at the time of application to the Tea Board of India and must have a valid current membership. Importantly, Indian tea companies received 1.5 times income tax exemptions under Section 35.1 (ii) of the Income Tax Act of 1961 on amounts paid to the Tea Research Association or UPASI TRI as annual membership subscriptions. Such funding arrangements to both the Tea Research Association and UPASI TRI, whether direct or indirect, met the fund requirement for managing the tea research programmes in both organisations during the period (Tea Research Association, 2019).

Following the withdrawal of C.S.I.R. from the agreement with the Tea Research Association in 1990, funding to Tea Research Association was transferred to the Ministry of Commerce & Industry in grants-in-aid mode under non-plan heads via the Tea Board of India. From 1990 to 2001, the Tea Research Association received 75 per cent of the salary and bonus of scientific personnel and 33.33 per cent of all other employees, 75 per cent of books and journals, 25 per cent of other recurring expenditure, and 33.33 per cent of non-recurring expenditure related to tea research activities at Tocklai TRI (Annual Administrative Reports of TRA).

The Tea Board of India changed the funding formula to Tea Research Association in 2001, with a cap of Rs 3.28 Crores per year on ten identified items such as employees Salary & Allowances, Training, Consumable Stores, Power & Fuel, Repairs and Renewals, Printing & Stationery, Postage & Telegram, Tour Expenses, Meeting & Conference, Books & Journals. However, the release of committed research funds from the Ministry of Commerce and Industry to the Tea Research Association through the Tea Board of India was erratic and untimely due to the Tea Board of India's low allocation of budget on R&D heads beginning in 2001-02. As a result of the lower allocation and upper limit capping of Rs 3.28

crores, the Tea Research Association was facing financial difficulties in clearing statutory dues, salaries, research activities, development and maintenance, and so on.

The Tea Board of India proposed to the Ministry an Additional Excise Duty (AED) for tea R&D and other development activities at Re.1/kg

from 01.04.2003 to 31.03.2004 from the Indian tea industry. During the 10th Plan period (2003 – 2007), the Ministry of Commerce & Industry through the Tea Board of India started funding an additional 31% on the same heads from funds collected under Additional Excise Duty (AED) in addition to 49% funding on ten identified heads.

Table 4: Annual Budget vis-à-vis Funding of Tea Research Association

Year	Annual Budget in Crores	Total Grants-in-Aid received from MoC&I, Govt. of India in Crores	Total Membership Subscriptions received in Crores	Own Income in Crores	Total collection in Crore	Shortfall of Funds in Crores
2014-15	24.75	11.01	9.30	3.23	23.54	-1.21
2015-16	25.15	9.79	10.78	3.01	23.58	-1.57
2016-17	25.81	5.56	12.96	3.21	21.73	-4.08
2017-18	27.00	13.50	14.84	3.11	31.45	+4.45
2018-19	31.34	5.51	15.70	5.13	26.34	-5.00
2019-20	31.00	14.99	16.83	3.82	35.64	-4.64
2020-21	29.40	12.95	17.77	3.76	34.48	+5.08

(Source: Tea Research Association, 2021)

During the 11th Plan period (2007-2008 to 2011-2012), the Ministry of Commerce and Industry proposed limiting funding to only five heads. During that time, the funding was used as a planning scheme under the Tea Board's R&D head. The funding formula for 2007-08 to 2011-12 was approved at 80% on five categories, including employees salaries, provident funds, gratuity, medical, and training. On August 4, 2008, the Tea Board proposed to the Ministry of Commerce that, because the AED funds would be exhausted in 2009, the tea cess be increased by 20 paise and the funds collected from the cess used to fund tea research activities during the 12th Plan and beyond. As a result, the Government of India raised the tea cess to 50 paise from 30 paise in June 2011 but did not increase the allocation on R&D heads to the Tea Research Association.

The Government of India granted financing for Tea Research Association under the 12th Plan in December 2014, after a 32-month

delay. The Government of India opted to maintain the 80 per cent funding under Plan head with certain modifications, including 49 per cent for general expenditure under the same five heads as in the 11th Plan, and a suggested balance of 31 per cent on five heads for R&D projects. The entire value of 31% was Rs. 15 crores, while the Ministry approved only research projects totalling Rs 3.20 crores. During the year 2017-2020, the Ministry stated that support to Tea Research Association will be 49 per cent on five heads with a cap on 2016-17 spending, equating to an annual outlay of around Rs 10.50 crores. However, no special funds had been allocated for the tea research functioning of the Tea Research Association. The Tea Board of India released total grants-in-aid Rs 12.70 Crores in the year 2018-2019 and Rs. 12.90 Crores in 2019-2020 to Tea Research Association and UPASI together. (Tea Research Association, Tea Board of India, 2012-2020).

Table 5: Manpower Analysis of Tea Research Association 2011-2020

Year	Total Employees	Scientists	Scientific Assistant	Technical Assistant	Non-Scientific Assistant	Helper	Sub- Staff
2010-11	281	55	58	48	49	44	24
2011-12	274	60	56	48	45	41	24
2012-13	265	51	41	45	45	40	23
2013-14	267	78	50	38	42	36	23
2014-15	258	75	50	38	39	36	20

2015-16	238	76	44	32	32	34	20
2016-17	218	70	39	32	28	31	18
2017-18	204	66	36	32	27	27	16
2018-19	183	59	35	29	22	25	13
2019-20	168	58	30	24	22	22	12

Source: Annual Administrative Reports of Tea Research Association

The crisis of adequate human resources has an adverse bearing on the tea research outputs of the organisation. During the recent decade, the Tea Research Association has also experienced a reduction in human resources, which harms research outputs. The Tea Research Association had 281 employees in 2010-2011, but that number has dropped to 168 in 2019-20. Furthermore, several scientists have left the organisation in search of a better opportunity due to financial volatility in the organisation. Despite these limitations, the institute continues to serve the Indian tea sector through continuous research and innovations.

VII. NEED FOR GOVT. NEW POLICY DIRECTIONS AND INTERVENTIONS:

In India, tea is generally an agricultural product, while historically, it has been produced on an industrial scale by the organised sector, which has a significant corporate presence there. Small tea growers, on the other hand, have made significant contributions to India's overall tea production over the previous 30 years, accounting for 51% of the country's total tea production. A comprehensive assessment of the critical situation of declining productivity and challenges facing the Indian tea industry is required, as is the adoption of major structural and strategic decisions such as the redesigning of programmes and schemes, redefining the role of the Tea Board, restructuring all tea research institutes with time-bound delivery mechanisms and increased financial allocations by the government of India. To ensure the long-term viability of the Indian tea industry in the face of worldwide competition and new difficulties, it is critical that research, learning, innovation, and competence-building mechanisms be given considerable consideration to create a dynamic tea sector. Governments must adopt well-thought-out policy orientations and actions, as well as enough financial resources, to ensure the successful administration of tea research. All parties will benefit from a possible restructuring of all ailing tea research institutes under the full patronage of the Government of India, with enough scientific manpower and capital resources, and away from the control of the Tea Board of India.

Indian tea has lost the global markets since it continues to be traded as a commodity besides the value addition is limited. Thus, the industry needs to be competitive in production, marketing, logistics and product forms. Despite being one of the second largest producers of tea, India lacks properly organized production systems where small tea producers could manage to find a respectable place. The industry desperately needs capital at globally competitive rates and not subsidies in any form. So, the Indian tea industry needs to face the market realities, redefine its business strategies and reposition its products to gain a competitive edge over its competitors in the global market. For this, the first step that needs to be taken in this direction is the complete restructuring of the tea industry, redefining the roles of various agencies like the Tea Board of India and the producers' organizations, and developing a healthy partnership with the labour, a new management approach is required. (Asopa, V. N., 2007)

With the introduction of the Goods and Services Tax (GST), Labour Codes, Banking Reforms, and other initiatives, the Indian government has begun massive reforms and structural changes in the economy, taxes, and labour codes, which may impose early stress on the country's tea industry. Many different types of relief have been provided to the tea business, including infrastructures like garden roads, hospitals, schools, medical facilities, rations, and other welfare measures for the garden workers. The majority of agricultural initiatives administered by the Ministry of Agriculture are not yet applicable to the tea industry. The benefits of Ministry of Agriculture schemes such as the Pradhan Mantri Krishi Sinchai Yojana, the Accelerated Irrigation Benefit Program (AIBP), and the Pradhan Mantri Fasal Bima Yojana (PMFBY), among others, are not available to the tea industry. Government policies and programmes, such as soft loans for the modernization of tea plantations and factories, must be developed for the benefit of financially disadvantaged and ailing tea estates to maximise their quality production. Recently, different tea associations, brokers and tea companies requested the union government for reforms in the auction system, expansion of tea areas to 20% from 5%,

increasing domestic consumption, promotion of tea tourism, permission to export tea waste, raise of incentive rate of Rs.3/kg for production of orthodox teas and to work out a mechanism to exchange rupees for rubles to increase tea exports to Russia (Anantharaman, 2019).

A policy direction to place tea plantations under the Ministry of Agriculture and Farmers' Welfare is urgently needed to secure the long-term viability of the tea industry and to provide distributive justice for the people who work in them. Furthermore, the Indian Tea Research Institutes should ideally be under the control of the Indian Council of Agricultural Research (ICAR) rather than the ineffectual system of research management that currently exists under the control of the Tea Board of India. It is necessary for the Indian government to implement new policy measures in conjunction with the enactment of the new Tea (Promotion and Development) Act, 2022, to provide comprehensive institutional support to tea research, innovation, and extension in the country, as well as to promote and develop the tea industry in global standard. All unwarranted developments, as well as the poor human development of a large section of the population involved in the tea sector in India, call for appropriate intervention under the institutional structure of the Indian Council of Agricultural Research (ICAR), which would aid in the achievement of at least 11 of the 17 Sustainable Development Goals, as promoted by the United Nations, in the tea industry.

VIII. CONCLUSION:

Effective tea research management is the most important prerequisite for the Indian tea industry to overcome the challenges it is facing today. It is recommended that, due to the seriousness of the difficulties and challenges facing the Indian tea industry, the functioning of the Tea Board of India be re-evaluated by the concerned ministry of the Indian government. As revealed by the current review, the Tea Board of India's tea research management is ineffective, and this needs to be addressed promptly with policy directives from the government of India. Also important are the tea research institutes, which are supposed to be providing research and technological support for sustainable tea production, to increase productivity, increase market value, protect the environment, and improve social and environmental aspects in order to remain competitive in the global market. The restructuring and revitalization of Indian tea research institutes are necessary for the long-term benefit of the tea industry. The government of

India's support is essentially required for the restructuring and revitalisation of the entire tea sector, which will necessitate increased financial investments as well as specific policy decisions.

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REFERENCES:

- [1]. Anonymous, 2020, Indian bulk tea industry. ICRA Research, October 2020
- [2]. Anantharaman A., 2019, Indian tea industry demands Government bailout from looming financial crisis, World Tea News, September 3, 2019
- [3]. Asopa, V. N., 2007, Tea Industry of India: The cup that cheers has tears', Indian Institute of Management, Ahmadabad
- [4]. Barbora, B C, 1992, Tocklai 1911-1991, Tea Research Association, Jorhat
- [5]. CAG Audit Report on Performance of Tea Board of India, 2010-2011
- [6]. Ghosh Hajra N., 2021, Indian tea: robust growth amid rising challenges, Journal of Tea Science Research, 11(1): 1-15 (doi: [10.5376/jtsr.2021.11.0001](https://doi.org/10.5376/jtsr.2021.11.0001))
- [7]. Indian Tea Association, Annual Reports, 1907-2001.
- [8]. Indian Tea Association, Report of the General Committee, 1905-1969.
- [9]. Indian Tea Association, Scientific Department, Quarterly Journal, 1911-1932.
- [10]. Mann, H. H., 1918, The Early History of the Tea Industry in North East India, 1918
- [11]. Tea Research Association, Annual Scientific Report, 1964-2018
- [12]. Tea Research Association, Annual Administrative Report, 1964-2020
- [13]. Tea Board of India, Annual Reports, 2014, 2015, 2019, 2020
- [14]. The Report of the Ad Hoc Committee on

- Tea, 1950, Government of India.
- [15]. UPASI (United Planters Association of South India), (2006) - Handbook of Plantation Facts, Valparai
- [16]. Web Sites consulted:
- [17]. <http://www.commerce.nic.in/MOC>
- [18]. <http://www.indiatea.org>
- [19]. <http://www.tocklai.org>
- [20]. <http://www.teabord.gov.in>
- [21]. <http://www.tea.co.in>
- [22]. <http://www.upasi.org>