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The Case of Kenya's Tea Industry

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Acronyms and Abbreviations

APC	Agricultural Produce Cess
ASARECA	Association for Strengthening Agricultural Research in East and Central Africa
CEO	Chief Executive Officer
DFID	Department for International Development
DIT	Directorate of Industrial Training
EAC	East African Community
EATTA	East African Tea Trade Association
FARA	Forum for Agricultural Research in Africa
GDP	Gross Domestic Product
ha	hectares
IFPRI	International Food Policy Research Institute
IFS	International Foundation for Science
JICA	Japanese International Cooperation Agency
KEPHIS	Kenya Plant Health Inspectorate Service
kg	kilograms
KNBS	Kenya National Bureau of Statistics
KRA	Kenya Revenue Authority
KRB	Kenya Roads Board
KTCC	Kenya Tea and Conservation Corporation (formerly Nyayo Tea Zones Development Corporation)
KTDA	Kenya Tea Development Agency (formerly Kenya Tea Development Authority)
KTGA	Kenya Tea Growers Association
MOA	Ministry of Agriculture
MOW	Ministry of Public Works
NCST	National Council of Science and Technology
NEMA	National Environment Management Authority
NTZDC	Nyayo Tea Zones Development Corporation
TBK	Tea Board of Kenya
TRFK	Tea Research Foundation of Kenya
TRIEA	Tea Research Institute of East Africa
TWAS	Third World Academy of Science
UNDP	United Nations Development Programme

Abstract

This study provides an assessment of the performance of producer financing in Kenya's tea industry. It is based on a comprehensive literature review, in combination with analysis of data derived from the Tea Board of Kenya (TBK) and the Tea Research Foundation of Kenya (TRFK). The secondary data analysis is complemented by expert opinions from representative of the Kenya Tea Development Agency (KTDA), the Kenya Tea Growers Association (KTGA), TBK, TRFK, and the Ministry of Agriculture (MOA), particularly the State Corporations Department.

Currently, the tea industry operates under the Tea Act (CAP 343) and Agricultural Act (CAP 318) of the laws of Kenya. While the Tea Act is vested with regulatory services, the Agricultural Act focuses on oversight of the whole production process, as a technical arm. In addition, the Tea Act mandates that TBK undertake tea research through its technical arm, TRFK, per the State Corporations Act (CAP 446), which is also incorporated as a company limited by guarantee under the Companies Act (CAP 486) of the laws of Kenya. TBK is both a producer body that promotes and represents the tea industry, and a parastatal body appointed by government to regulate the industry. TBK is charged with facilitating research into all aspects of tea growing, manufacturing, and pest and disease control.

To finance its (regulatory, promotional, and research), activities and programs the Board levies a manufacturing cess based on processed tea deliveries by all registered tea factories. The cess is statutory, and is currently the main source of revenue for the Board. The Tea Act provides a review by the Minister for Agriculture after consultation with the Board. Currently, the rate of the cess is at KSh. 46 cents per kg of processed tea. Today, the manufactured tea cess revenue collected is shared between TBK and TRFK on a 50/50 basis and used to finance both institutions. In addition, TBK is mandated to collect an Agricultural Produce Cess on green leaf production for the local authorities where tea is produced, disbursing it to the District Tea Road Committees for road infrastructure maintenance.

The major challenges facing TRFK are increasing the adoption of improved technologies to close the gap between research and actual farm yields. The Foundation's efforts to enhance branding, product diversification and value addition are limited by the following challenges: lack of an adaptive tea research factory and other relevant equipment; qualified and experienced personnel in the fields of food science, biochemistry and process engineering; and inadequate exchange of market information. Inadequate processing capacities in Kenyan factories and lack of operational policies and guidelines for intellectual property rights are still a challenge.

1. INTRODUCTION

The tea industry has historically been one of the greatest success stories in Kenyan agriculture. Tea was introduced into Kenya from India by European settlers in 1903. Over the years Kenya has expanded its tea production to be the fourth-largest tea producer, after China, India, and Sri Lanka, and the second-largest tea exporter after Sri Lanka. Currently, Kenya is the world's leading exporter of black tea. Estimates from the Tea Board of Kenya (TBK) indicate that the total area under tea production expanded from 24,448 hectares (ha) at independence in 1963, to about 160,000 ha in 2010. On the other hand, tea production has increased from about 18,000 tons in 1963 to just under 400,000 tons of in 2010 (TBK 2010). Information from TBK reveals that the country consumes only 5 percent of the tea it produces; the remaining 95 percent is exported, either directly or through the Mombasa Tea Auction.

Tea has put Kenya squarely on the world map, with over 50 countries importing Kenyan tea. The country accounts for 10 percent of total global tea production and commands a remarkable 21 percent of global tea exports outside producing countries. The tea industry contributes about 14 percent of the agricultural gross domestic product (GDP), which is equivalent to 4 percent of Kenya's GDP (KNBS 2010). An estimated 3 million Kenyans (about 10 percent of the total population) derive their livelihoods from the tea industry. Currently, tea ranks second as a foreign exchange earner after tourism in Kenya, contributing 26 percent of the total foreign exchange earnings (TBK 2010). Tea growing and manufacturing are undertaken in rural areas, thereby contributing to the development of rural infrastructure, as well as enhancing the economic well-being of rural communities.

The vibrant industry is characterized by two sectors that have different structures: estate plantations established in the early 1920s with production units larger than 20 ha, and smallholders established after independence in 1964 with smaller units averaging only 0.25 ha per farmer. Smallholders continue to dominate tea production in Kenya. Small-scale production accounts for 65 percent of area and about 62 percent of production (Nyangito 2000). However, the average yield per hectare is higher in large estates than smallholder farms largely due to better use of technology, inputs, and economies of scale. While yields in the estates have declined/stagnated in the last decade, smallholder yields have continued to rise overtime (Kamau 2008).

The remarkable growth of Kenya's tea industry has been attributed to the supportive role of TBK and the management of the smallholder sector by the Kenya Tea Development Agency (KTDA) (Nyangito 2000). TBK is both a producer body that promotes and represents the tea industry, and a parastatal body appointed by government to regulate the industry. TBK is charged with facilitating research into all aspects of tea growing, manufacturing, and pest and disease control. It is funded through a tax (cess/levy) on tea—based on the volume processed—and is collected by the board. TBK undertakes research through the Tea Research Foundation of Kenya (TRFK), which is TBK's technical arm, financed through the proceeds of the tea levy.

While the remarkable performance of the tea sector in Kenya has been widely documented, the performance of farmer-financed tea research and its contribution to the sector's productivity remains largely unexplored. This study provides an assessment of the performance of producer financing in Kenya's tea industry. It is based on a comprehensive literature review in combination with an analysis of data derived from secondary sources (TBK and TRFK). The secondary data analysis is complemented by expert opinions from representative of the Kenya Tea Development Agency (KTDA), the Kenya Tea Growers Association (KTGA), TBK, TRFK, and the Ministry of Agriculture, particularly the State Corporations Department.

2. GOVERNANCE OF THE TEA INDUSTRY IN KENYA

The legal framework governing the tea industry in Kenya is spelled out in the Tea Act (CAP 343) and the KTDA Order established under the Agriculture Act (CAP 318) of the laws of Kenya to control and regulate

smallholder tea production. The Tea Act provides for regulating and controlling the production, manufacturing, and export of tea, and covers related matters. The Act was enacted in 1960 and has been revised over the years, most recently in 2010; it gives control and regulation of the tea industry to TBK. Smallholder tea production is supervised by the Kenya Tea Development Agency (formerly the Kenya Tea Development Authority), a state corporation established under the Agriculture Act and the Kenya Tea Development Authority Order in 1964.

Two private organizations operate in the industry: KTGA represents the interests of commercial tea estates at government or trade discussions, and the East African Tea Trade Association (EATTA) runs the Mombasa tea auction and regulates tea brokers, buyers, and sellers. The tea industry also features a conservation agency, the Kenya Tea and Conservation Corporation (KTCC) formerly Nyayo Tea Zones Development Corporation (NTZDC). NTZDC was established through a legal notice in 1986 and incorporated as a state corporation in 2002 through an order under the State Corporations Act (CAP 446).

Initially these acts were based on government-controlled policies, but with a shift toward liberalized markets, the tea sector became part of the Government of Kenya/World Bank agreement under the Public Enterprise Reform Program to liberalize strategic parastatals (World Bank 1992). The reform process was slow to begin with, but eventually led to a new Tea Act that liberalized the sector in 2000 (Government of Kenya 2000). Currently, the tea industry operates under the Tea Act (CAP 343) and Agricultural Act (CAP 318) of the laws of Kenya. While the Tea Act is vested with regulatory services, the Agricultural Act focuses on oversight of the whole production process, as a technical arm. In addition, the Tea Act mandates that TBK undertake tea research through its technical arm, TRFK, per the State Corporations Act (CAP 446), which is also incorporated as a company limited by guarantee under the Companies Act (CAP 486) of the laws of Kenya.

Tea Board of Kenya

TBK is the apex body of the tea industry established to regulate tea growing, manufacturing, exports, and to carry out research on tea. The Act was amended in 1999 to liberalize the tea industry. The amended mandate of the Board includes (1) licensing tea manufacturing factories; (2) carrying out research into all aspects of tea growing, manufacturing, and pest and disease control; (3) registering growers, buyers, brokers, packers, management agents, and person dealing in tea; and (4) promoting Kenya tea in both local and international markets. Currently, 62 smallholder-owned factories managed by KTDA and 39 private estate companies have been licensed. The Board also collects and disseminates information relating to tea.

TBK is a statutory body under the Ministry of Agriculture (MOA). The Tea Act provides for an elected Board comprising at least 16 members representing producers (10), Government (2), and trade (1), along with two nominees from industry and MOA's Permanent Secretary and Director of Agriculture. In addition, there are two co-opted ex officio members from the Ministry of Finance and Office of the President. Currently, 11 members of the board are elected directly by stakeholders; 6 from small-scale growers, 4 from plantation growers, and 1 from tea trade. In addition, 2 members are nominated from the Government and 2 from industry, while the managing director is the ex officio member. The Board elects its own chairman and vice chairman.

In fulfilling its research mandate, the Board provides policy guidelines to TRFK, which investigates and researches all matters relating to the industry. Research activities are aimed at improving planting material, husbandry, yields, quality, and disease and pests control. The Foundation provides advisory services to the growers on specific problems encountered in tea cultivation through organized field visits, demonstrations, and publication of research findings and reports. The Tea Act mandates the Board to oversee the smooth and orderly functioning of the tea industry through policy guidance, licensing, registration, and trade development. TBK monitors compliance on all aspects of tea regulation and control of cultivation and manufacturing of tea.

To finance its activities and programs (regulatory; promotion; and research), the Board levies a manufacturing cess based on processed tea deliveries by all registered tea factories. The cess is statutory, and is currently the main source of revenue for the Board. The Tea Act provides a review by the Minister for Agriculture after consultation with the Board. Currently, the rate of the cess is at KSh. 46 cents per kg of processed tea. Today, the manufactured tea cess revenue collected is shared between TBK and TRFK on a 50/50 basis and used to finance both institutions. In addition, TBK is mandated to collect an Agricultural Produce Cess (APC) on green leaf production for the local authorities where tea is produced, disbursing it to the District Tea Road Committees for road infrastructure maintenance.

APC is a levy on agricultural produce collected and utilized as provided for under the Agricultural Act Cap 318 Section 192 (A) Sub-section 1 and the Local Government Act Cap 265 of the Laws of Kenya. This law provides for the Minister for Local Government, with consent of the Minister for Agriculture to impose a cess at an agreed percentage rate of the gross produce value purchased from an owner within the jurisdiction of Local Authority (Council). The cess so levied is for use in maintaining roads and other services within a specific local authority, related to the sectors within which such monies are levied. Currently a cess is levied on a wide range of agricultural produce in Kenya at the rate of 1 percent of the gross income on produce purchased from owners. Such produce include tea, coffee, wheat, maize, cashews, pyrethrum, sisal, sugarcane, cotton, tobacco and barley.

TBK is the appointed collecting agent for the APC on tea. TBK's responsibility is to collect the cess due from producers and channel it to the respective local authorities and district tea cess committees (tea factories/estates). It is the responsibility of the respective district tea cess committees and local authorities—which receive 80 and 20 percent of collected cess, respectively—to execute roads maintenance programs and provide other services. The district tea cess committees report to TBK on quarterly basis indicating how the monies have been used. The cess has assisted tea stakeholders in maintaining roads, enabling timely delivery of tea to factories, thereby ensuring maintenance of high-quality production. Through APC, which is levied at 1 percent of growers income (Kshs 20 cents per kg of green leaf), the tea industry contributes over Kshs 300 million per year for road maintenance.

Tea marketing and research initiatives in Kenya are due for reform, since Parliament passed a bill in December 2010 aiming to boost the sector's competitiveness. Among the key changes proposed is the replacement of the current system used to fund TBK. The bill proposes to replace the current volume-based financial model with a value-based model, known as the *ad valorem* levy. This would mean that the cess, not to exceed 2 percent of gross sales, would be collected by the Board on imported or exported tea. In the proposed amendment to the Tea Act, 55 percent of the collected levy would be channeled to TBK, 40 percent would fund TRFK, and the remaining 5 percent would be allocated to infrastructure development. The *ad valorem* levy will provide resource capacity to promote Kenyan tea, implement value addition, facilitate product diversification, and fund research programs.

The amended Tea Act also proposes the abolition of APC and reduction in TBK's board from the 16 to 11 members, in line with provisions of the State Corporations Act (CAP 446). For the purposes of road maintenance, with the abolition of APC, MOA would liaise with the Kenya Roads Board (KRB) and the Ministry of Public Works (MOW) to designate "special purpose" rural access roads given their economic importance.

Tea Research Foundation of Kenya

TRFK was established in 1980 to replace the former Tea Research Institute of East Africa (TRIEA). The foundation was established with the objective of promoting research and investigating problems related to tea and other crops and systems of husbandry associated with tea throughout Kenya, including productivity, quality, and sustainability of land in relation to tea planting and ancillary matters. TRKF's research has focused on developing improved clones and appropriate technologies for improved yield and quality through the development of appropriate practices for tea production, including breeding,

clonal selection, correct plant nutrition, optimal crop husbandry methods, crop physiological studies, control of major pests and diseases, manufacturing, marketing, and use of the finished product.

About 70 percent of TRFK's funding is sourced from TBK through manufacturing cess levied on made tea (TRFK 2006), supplemented by funds generated internally through its own tea estate and the sale of planting materials and advisory analytical services, and so on. Core funds cover the personnel emoluments and recurrent operational costs. No provision is made for capital development and improved terms and conditions of service for employees. Furthermore, the actual levels of funding through the levy depend on the marketed tea and the prevailing prices in the international markets.

The Research Director is the Chief Executive Officer (CEO) as provided for by the Foundation's Memorandum and Articles of Association (1980) and the State Corporations Act (Cap 446). The Foundation's policy making organ is a Board of Directors. The Board of Directors is constituted by the Minister for Agriculture, and serves for a period of three years, as prescribed by the Memorandum and Articles of Association as registered under the Companies Act (Cap 486) Laws of Kenya. Its composition reflects all the stakeholders and the Government as provided for in the State Corporations Act. The Board is the policy making organ of the Foundation.

Currently, the Foundation's board is composed of 13 members appointed under article 30 of the Articles of Association of the TRFK. They include; a chairman nominated by the Minister-MOA, the CEO-TRFK, the Permanent Secretary- MOA, the Agriculture Secretary-MOA, the Permanent Secretary-MOF, the chairman-TBK, Director-KARI, Chairman-KTDA, Director-KTDA, a representative for KTGA and three other nominees of the Minister-MOA. The current TRFK's Board is dominated by government appointees numbering nine while only five board members are elected from TBK, KTDA (2), KTGA. In conformity to the Tea (amendment) Bill of 2010 and the provisions of the State Corporations Act, the composition of the TRFK Board shall be reviewed to a maximum of 11 with a balanced mix between elected members and Ministerial appointees.

Kenya Tea Development Agency

KTDA was incorporated under the Companies Act in 2000 as an independent and private enterprise, owned by all of Kenya's small-scale tea farmers through their respective factory companies, which are in turn independent legal entities. Currently KTDA Ltd. manages 62 tea factories in the smallholder subsector serving over 500,000 growers. KTDA manages the tea factories on behalf of farmers, charging a management fee currently fixed at 2.5 percent of the proceeds of total sales. KTDA Ltd. is owned by the smallholder tea growers through the tea factory companies, who elect one director per zone to represent them on the KTDA Ltd Board.

KTDA Ltd has a Board of Directors comprising 15 members: 12 elected grower representatives from each catchment area, operationally referred to as zones, and 3 executive directors (a managing director, operations director and finance director). The smallholder tea sector ownership structure follows a unique model, empowering the farmer from the grassroots. As a private company, KTDA is owned by 62 corporate shareholders (factory companies) directly owned by farmers as individual shareholders of their respective factory company. The factory companies are owned by farmers and governed through a Board comprising six farmer representatives. The factory companies own leaf collection centers that are managed by five elected farmer representatives.

The relationship between KTDA Ltd. and the factory companies is two-fold. The first relationship is that of KTDA as an investor in the tea factory companies, where KTDA owns shares while the second level is with KTDA Ltd as a managing agent via a management agreement. Similarly, the relationship between the growers and tea factories is also two-fold: the growers both supplier of green leaf to the factory, and are (in most cases) factory shareholders. This relationship has developed into a conflict of interest causing increasing discontent both between the growers and the factory directors on the one hand, and the factory directors and KTDA on the other.

Prior to 2000, KTDA was the Kenya Tea Development Authority, which was instrumental in the introduction of tea production to small-scale producers, and had managed tea factories on behalf of farmers since 1964. Before liberalization, the authority was exclusively responsible for smallholder tea growing, processing, and marketing. The newly formed agency assists farmers by purchasing fertilizers in bulk mainly from international suppliers. The fertilizer is offered to tea producers on credit, to be recovered after the tea is sold. KTDA also offers extension services to smallholder tea producers and is involved in sourcing funds for factory construction and renovations. Notably, KTDA operates and manages factories; markets black tea internationally; and buys green leaf from smallholders, paying them on a monthly basis and at the end of each financial year.

3. TRENDS IN TEA RESEARCH FUNDING IN KENYA

Tea research for eastern Africa was initially carried out by TRIEA, headquartered in Kericho, Kenya, with substations in Uganda and Tanzania. TRIEA was funded by contributions from the tea boards of Kenya and Uganda, and the Tanzania Tea Authority. After the collapse of the East African Community (EAC) in 1977, TRFK was established to continue tea research. Between 2000 and 2010, processed tea production increased by 69 percent, from 236 million kilograms (kgs) to 399 million kgs (Table 1). Over the same period, Kenya's tea earnings in constant prices rose by 27 percent, from Kshs 72 billion in 2000, to Kshs 91 billion in 2010. However, the real cess revenue declined by 21 percent, from Kshs 218 million to Kshs 173 million per year. Similarly, the cess revenue as a share of the value of tea output declined by 37 percent, from about 0.3 in 2000 to about 0.2 percent in 2010. This is not unexpected because the rate of the levy has not been reviewed in the past 10 years.

Table 1. Tea production trends at constant prices, 2000–10

Year	Tea output (million kgs)	Output value (million 2009 Kshs)	TBK cess (million 2009 Kshs)	Cess as a share of output (%)	TRFK funding as a share of output (%)
2000	236	72,101	218	0.30	0.15
2001	295	63,346	258	0.41	0.20
2002	287	63,778	245	0.38	0.19
2003	294	56,542	229	0.40	0.20
2004	325	65,799	226	0.34	0.17
2005	328	59,064	208	0.35	0.18
2006	311	61,465	186	0.30	0.15
2007	370	53,771	212	0.39	0.20
2008	346	67,345	172	0.26	0.13
2009	314	68,178	142	0.21	0.10
2010	399	91,286	173	0.19	0.09

Source: TBK (2000–10).

Notes: TBK indicates the Tea Board of Kenya; TRFK indicates the Tea Research Foundation of Kenya.

In the mid-1990s, approximately one-third of the tea cess revenue was allocated to research (Kangasniemi 2002). As the industry expanded, research has continuously expanded. However, cess funding for research, however, has declined relative to the value of tea output, reaching approximately 0.15 percent in 2000 and only 0.09 percent in 2010 (Table 1). This represents extremely low research intensity and considerably lower levels than for most other crops in Kenya or in neighboring countries.

In addition to the manufacturing cess, tea farmers in Kenya pay numerous other charges, taxes, and levies to different government institutions, even in situations where no direct service is rendered (Table 2). For instance, the national standards body—the Kenya Bureau of Standards—charges a levy of 0.2 percent on the factory value of processed tea to a maximum of Kshs 0.4 million, yet no direct service is rendered to the producer. Other taxes include land rates, land rents, an agricultural produce cess, a

value-added tax, a corporate tax, and import declaration fee, an environmental impact assessment levy by the National Environmental Management Agency (NEMA), an inspection fee by the Kenya Plant Health Inspectorate Service (KEPHIS), and import duty on packaging, furnace oil taxes, a brokerage fee, a Directorate of Industrial Training (DIT) levy, and the aforementioned KTDA management fee.

Table 2. Taxes and levies directly or indirectly affecting tea growers

Levy	Collecting agent	Level
Agricultural produce cess	Local government	1 percent of the value of green leaf
Value-added tax (VAT)	Government	16 percent of sales value
Manufacturing cess	Tea Board of Kenya	Kshs 46 cents per kilogram of manufactured tea
Corporate tax	Government	30 percent of net profit
Directorate of Industrial Training levy	Directorate of Industrial Training	Kshs 300 per employee
Standards levy	Kenya Bureau of Standards	0.2 percent of value of processed tea ≤ Kshs 400,000
Environmental impact assessment levy	National Environmental Management Agency	0.1 percent of investment
Inspection fee	Kenya Plant Health Inspectorate Service	3,000 per consignment
Import duty on packaging material	Government	25 percent of the cost, insurance, freight (CIF) value
Import declaration fee	Government	2.75 percent of value
Furnace oil taxes	Government	Excise duty of Kshs 0.6 per liter and 16 percent VAT
Brokerage fee	Tea Broker	0.75 percent of growers proceeds of processed tea
KTDA management agency Fee	KTDA	2.5 percent of net sales
Land rates and rents	Local government	0.3–0.75 percent of undeveloped value

Source: Compiled by author.

These taxes have become a heavy burden on producers, and in some cases amount to duplicate taxation. Most of these charges are borne by the overburdened smallholder farmers who contribute about 62 percent of the tea cess revenues. The KTDA management fee, at 2.5 percent of net sales, is borne by the smallholder growers over and above all the other levies that producers bear, yet the smallholder farmers own the factories that KTDA manages. The Tea Amendment Bill of 2010 proposes to abolish some of these levies to lighten this burden, especially for smallholder growers.

4. RECENT PERFORMANCE INDICATORS FOR THE TEA RESEARCH FOUNDATION OF KENYA

TRFK comprises five research departments focusing on agronomy, botany, chemistry, crop environment, and plant protection. In addition, the Foundation operates an extension service and has a research economist on staff. All researchers are based at headquarters, although field experiments are conducted on farmers' fields throughout the country. Day-to-day management is delegated to its director, assisted by a deputy director. Tables 3, 4 and 5 represent the expenditure trends, sources of funds and staffing trends at the TRFK over the last 10 years. Over the last decade, TRFK expenditures have exceed its allocations as indicated in Tables 3 and 4. For instance, in 2010, TRFK total expenditure at constant prices was estimated at Kshs 106 million (Table 3), while the total funding in the same year was Kshs 90 million implying that the Foundation was operating at a budget deficit. The Foundations deficit has been growing over the years to imply that it receives inadequate funding from TBK to undertake its research and training role.

Table 3. Expenditure trends at the Tea Research Foundation of Kenya, 2000–10

Year	Personnel	Operating	Maintenance	Training	Capital	Total
(constant 2009 Kshs)						
2000	53,057,833	72,461,926	21,176,162	5,620,369	24,067,160	176,383,450
2001	59,237,579	72,773,162	24,321,458	5,802,639	–	162,134,838
2002	64,283,428	84,903,010	23,078,269	5,933,203	23,152,421	201,350,331
2003	54,265,034	74,251,727	18,562,645	3,429,539	2,553,071	153,062,017
2004	55,171,169	50,702,797	12,026,273	2,948,110	5,124,577	125,972,926
2005	43,913,687	48,220,094	12,097,554	3,462,059	4,099,804	111,793,198
2006	49,106,257	60,260,467	15,015,893	4,675,314	10,916,873	139,974,804
2007	50,919,383	58,166,920	14,120,607	2,911,680	8,382,132	134,500,723
2008	45,213,754	41,593,938	7,473,378	2,193,610	48,392	96,523,072
2009	43,150,498	34,198,750	11,763,367	1,439,224	655,920	91,207,759
2010	49,878,221	41,664,841	11,559,046	1,848,501	795,519	105,746,127

Source: TRFK (2000–10).

Relative to its contribution to national development, tea research in Kenya is largely underfunded. Over the past decade, the Foundation’s core funding from TBK in real prices declined from Kshs 116 million in 2000, to Kshs 77 million in 2010 (Table 4). TBK’s 2010 funding to TRFK represents only 0.08 percent of the Kshs 91 billion value of tea earnings; hence tea cess revenues are grossly inadequate. TRFK expenditures during 2000–10 fell by 40 percent, from Kshs 176 million to Kshs 106 million (Table 3). Available funds are not always sufficient to cover projected expenditures in any given year. If other sources of funding—such as tea sales from TRFK’s estate, consultancies, donors, and interest—are factored in, total funding in 2010 amounted to Kshs 90 million. These estimates indicate a budgetary deficit of about 7 percent that year.

Table 4. Funding sources for the Tea Research Foundation of Kenya, 2000–10

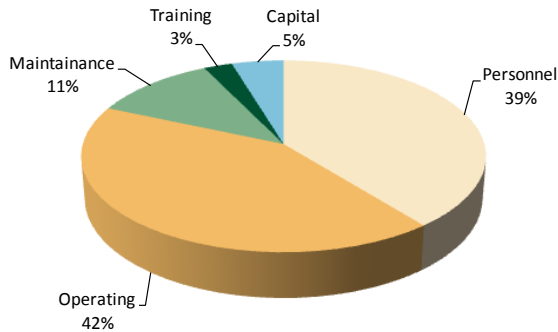
Year	Taxes (TBK)	Sales	Consultancies	Donors	Interest	Total
(constant 2009 Kshs)						
2000	116,173,410	1,750,543	1,440,950	–	1,855,063	121,219,966
2001	136,394,176	3,488,163	1,281,645	–	879,278	142,043,263
2002	155,244,519	5,459,513	1,103,811	–	516,178	162,324,021
2003	131,576,465	5,088,703	1,133,480	–	130,337	137,928,984
2004	124,329,017	5,067,669	1,199,350	–	100,301	130,696,338
2005	92,454,802	5,072,766	1,222,943	–	185,902	109,801,251
2006	107,578,850	3,076,456	1,036,140	–	218,048	97,690,078
2007	93,443,498	2,921,252	2,887,286	–	68,615	105,736,707
2008	77,782,681	2,516,195	1,704,060	–	30,495	92,307,500
2009	78,486,929	3,138,314	1,648,933	16,651,974	15,601	99,941,751
2010	76,537,939	2,967,412	1,357,082	9,410,879	8,954	90,282,265

Source: TRFK (2000–10).

Note: TBK indicates the Tea Board of Kenya.

During 2000–10, the vast majority of TRFK’s budget was consumed by operating and personnel costs, at an average of 43 and 38 percent, respectively (Figure 1). Staff remuneration accounted for 65 percent of TBK’s core funding to TRFK (Kshs 50 million of a total of Kshs 77 million in 2010). In the past decade, staff remuneration and operating costs grew steadily, whereas investments in training and capital declined, and maintenance expenditures remained fairly stable (Table 3).

Figure 1. Expenditure shares of the Tea Research Foundation of Kenya, 2000-10 average

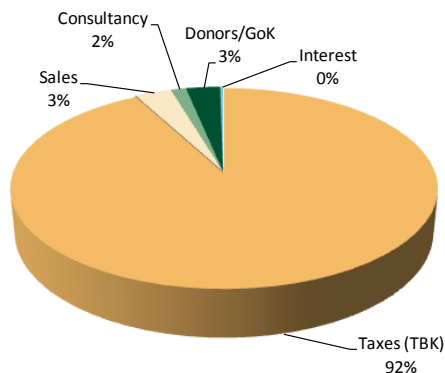


Source: Table 3.

While core funding represents about 93 percent of TRFK’s yearly budget, the remainder is generated internally through the Foundation’s tea estate and other services. Core funding covers personnel and operating costs. No provision is made for capital improvements and enhanced employment conditions. In addition, actual funding levels depend on levy revenues, which in turn depend on the amount of tea marketed and prevailing prices on international markets. Given that tea is the leading cash crop, it is anticipated that the government will take more responsibility for funding tea research and development activities (through TBK), but the Foundation is committed to establishing alternative sustainable funding sources. Current and potential alternative funding sources include revenues derived from TRFK’s tea estate, the commercialization of proven technologies, consultancies and contract research, and government grants.

During 2000-10, the Foundation generates an average of 3 percent of its total funding from TRFK’s tea estate. This amount is only able to support the operational costs of the Estate. The Foundation is however committed to improving the earnings through increasing production of tea per unit area, improving the quality of tea, and product diversification, thus assisting to fund research. A closer examination of the trends between the sources of funds indicates that the tea cess was the dominant source of funding at 93 percent during the ten-year period (Figure 2). Compared with the cess funding, donor funding to TRFK has been relatively low at an average of 2 percent (Figure 2). A dominant share of the funds reported to be donor funding are generated from the government to support TRFK’s budgetary deficits. However, it should not be lost on the keen observer that public institutions have a tendency of underreporting donor funding.

Figure 2. Funding source share of the Tea Research Foundation of Kenya, 2000-10 average



Source: Table 4.

The Foundation has a core staff of qualified and experienced scientists (Table 5). As of 2010, TRFK employed 13 researchers and 124 research support staff (technical and administrative staff, excluding those working on TRFK’s tea estates). This represents a research intensity ratio of one researcher per 50,000 farmers. The 2010 ratio of support staff to researchers was about 10 to 1, representing a slight decline from the 12 to 1 ratio reported in the early 1990s (Roseboom and Pardey 1993). Operating funds per researcher during the 2000–10 period are roughly estimated to have averaged Kshs 377,000. This represents a huge drop from the Kshs 650,000 in the 1990s reported by Roseboom and Pardey (1993). However, the expenditure per researcher at TRFK is still higher than that devoted to KARI researchers.

Table 5. Staffing trends at the Tea Research Foundation of Kenya, 2000–10

Year	No. of researchers	No. of (technical and administrative) support staff	Total (research and support) staff	No. of tea farmers
2000	11	113	124	365,507
2001	11	113	124	361,609
2002	11	103	114	408,318
2003	13	107	120	409,518
2004	13	107	120	393,730
2005	11	110	121	482,652
2006	10	130	140	533,447
2007	10	129	139	551,490
2008	11	123	134	596,335
2009	13	124	137	598,866
2010	13	124	137	632,651

Source: TRFK (2000–10).

Note: Data exclude support staff working on TRFK’s tea estates.

As of 2010, 5 of TRFK’s 13 researchers held PhD degrees, 4 were qualified to the MSc-degree level, and the remaining 4 held BSc degrees. In addition, 2 of the 4 MSc-qualified researchers were pursuing PhD training, all 4 researchers with BSc degrees were undertaking postgraduate studies. The most senior TRFK researchers had over 20 years experience, and some had worked with TRIEA prior to the collapse of the East Africa Community in 1977. TRFK’s research division had published long list of articles in peer-reviewed journals, especially those focusing on tea research, such as the *Tea Journal*.

With appropriate institutional arrangements, the Foundation can use its researcher to raise additional funding through consultancies, research contracts, and collaborations. The scientists can also attract additional funding by submitting research proposals for grants awarded by agencies like the Ford Foundation, Rockefeller Foundation, Association for Strengthening Agricultural Research in East and Central Africa (ASARECA), the International Foundation for Science (IFS), United Nations Development Programme (UNDP), Japanese International Cooperation Agency (JICA), UK Department for International Development (DFID), National Council of Science and Technology (NCST), and Third World Academy of Science (TWAS). This will require the Foundation to create capacities in these areas.

Overall, funding for tea research has been relatively dependable. TRFK has avoided both the unsustainable expansion of its payroll and the disruptive funding shortfalls that often afflict public sectors in Kenya. The Foundation has a core staff of qualified and experienced scientists who, with a few exceptions, have had sufficient operating budget to conduct their work. TRFK has offered salaries that, while modest in comparison with those offered in the private sector, have been reasonably competitive with other Kenyan research organizations. While government funding has been sufficient to support these salary levels, a few areas of concern need to be addressed so that TRFK can improve its staff retention rates: salary improvements, housing allowances, and housing loan schemes for TRFK’s senior staff.

Efficiency of the Tea Research Foundation of Kenya

The allocation of resources within TRFK appears to be reasonably efficient and has been enhanced by modifications to its governance structure that allow industry representatives to provide effective oversight of the research agenda. While no rigorous evaluations have been made, the available evidence suggests that TRFK has performed well. Its long list of publications indicates significant scientific activity, and substantial efforts to communicate results to various clients. More importantly, the list of research results released to and adopted by the clients is equally impressive, ranging from improved clones and agronomic practices to improved processing methods. The Foundation's operational efficiency is undermined, however, by underfunding of research based on the tea cess. Tea research funding could be greatly improved were the calculation of the cess modified to the proposed *ad valorem* system, provided for in the 2010 Tea Amendment Bill, and collected by the Kenya Revenue Authority rather than TBK.

Over time, the Foundation has developed over 914 improved clones, 49 of which have been selected for consistent superiority in yield and quality, and released commercially by both smallholder and large estate growers. The 49 clones selected by TRFK for consistent superiority in black tea quality and yield have been extensively planted by smallholders, and it is reported that the quality of the black tea produced by Kenyan growers is partly due to these improved clones. By 1999, the smallholder tea sector was 80 percent clonal, with one clone (TRFK 6/8) contributing close to 60 percent of that share (Wachira 2002). Nevertheless, in keeping with good agricultural practices, TRFK has been encouraging growers to cultivate diverse clonal germplasm in order to access greater genetic diversity at the farm level and thus create a buffer against the risks of monocropping.

Thirteen of the 49 clones are capable of yielding 5,000–8,000 kg of processed tea per ha per year, representing some of the highest yields in the world (in magnitude of three times the average yields of unimproved tea). The major challenge, however, is increasing the adoption of improved technologies to close the gap between theoretical and actual farm yields. The Foundation's efforts to enhance branding, product diversification, and value addition are limited by (1) lack of an adaptive tea research factory and other relevant equipment; (2) lack of qualified and experienced personnel in the fields of food science, biochemistry, and process engineering; and (3) inadequate exchange of market information. Inadequate processing capacities in Kenyan factories and lack of operational policies and guidelines for intellectual property rights also remain a challenge.

There are no obvious biases against smallholders in the research agenda. Indeed, all researchers' workplans are approved by a Research Advisory Committee with broad representation from all stakeholders. All new planting by both the estates and smallholders relies on the improved clones released by TRFK. The yield gap between estates and smallholders—while still significant—has narrowed considerably, and many smallholders now achieve yields similar to those of estates. The main beneficiaries of TRFK's processing research have been the KTDA tea factories that process smallholder tea. While smallholders have probably benefited at least as much as from TRFK's research agenda as have the estates, they may not have been served well by the decision to maintain research funding at low levels. For instance, stronger breeding efforts targeted at marginal areas would probably have served the interests of many smallholders. Estates in contrast may have been more adequately served by low levels of effort, because they largely operate in the prime tea areas, conduct some research on their own, and have superior access to technologies developed in other countries.

Nevertheless, industry stakeholders have raised concerns with regard to TRFK's mandate. For instance, smallholder tea farmers do not always have significant influence on research priorities in these corporations. This feeling emanates from the fact that tea farmers are represented in the TRFK board through their management agency, KTDA. As such, farmers complain that there is little accountability to those who pay the bill, since all accountability actions are undertaken by KTDA. As a result, the research cost is viewed as a burden to smallholders. Growers' perception that the TRFK is ineffective and of little benefit to them may not be entirely true, however.

Perhaps a more worrying trend in TRFK's research priorities is the overconcentration on production-related (basic) research at the expense of other important areas of research, such as product diversification or value addition (applied research). While much emphasis has been given to agronomic research, relatively little effort has been devoted to applied research, especially in the area of processing. This bias has been attributed to acute constraints in terms of equipment and other required facilities to enable the Foundation to conduct research on value addition. For instance, TRFK has no research factory of its own in which to undertake processing research, but the industry would not allow the Foundation to conduct research in their factories. Moreover, a conflict of interest exists among some Board members, especially those from KTGA who are conducting parallel in-house research.

One of the factors undermining TRFK's efficiency is its limited financial base given that the tea levy has not been revised since 1994 (other than a huge depreciation of the Kenya shilling overtime and the effects of inflation). The Tea Amendment Bill 2010, as previously discussed, would address the problem, although it should be noted that the Foundation's mandate has recently been expanded to include training and research into product diversification, but no additional funding has been allocated to these activities.

In addition, smallholder growers report that the research focus has not been responsive to the needs of growers or industry stakeholders, for example, in the issuing of blanket fertilizer recommendations across the tea growing areas irrespective of agroecological zones. Given the differences in the tea zones across Kenya, research based on farmers fields is needed, and relatively little has been achieved in this regard. As a result, farmers have at times resorted to uprooting tea bushes, especially when international prices decline. This challenge is being addressed, however, given that TRFK's 2009 strategic plan sought to realign its research focus.

6. CONCLUSION

TRFK is a public research agency directly funded by farmers through a levy on tea collected by TBK. The Foundation is responsible for basic, strategic, applied, and adaptive research on tea, as well as technology packaging and transfer. Over the years, the Foundation has been recognized as a leading research institution both nationally and regionally. The Foundation has developed over 914 improved clones, 49 of which have been selected for consistent superiority in yield and quality and released for commercial exploitation by both smallholder and large estate growers. Thirteen of these clones are capable of yielding 5,000–8,000 kg of processed tea per ha per year, representing some of the highest yields in the world. Nevertheless, TRFK's efficiency is undermined by funding limitations

While no rigorous evaluations have been made, the available evidence suggests that TRFK has performed well. Its long list of publications indicates significant scientific activity and substantial efforts to communicate results to various clients. More importantly, the list of research results released to and adopted by the clients is equally impressive ranging from improved clones and agronomic practices to improved processing methods. However, the foundation's operational efficiency is undermined by the underfunding of research based on the low level of revenues generated through the tea cess. Tea research funding could be greatly improved once the tea cess is computed on an *ad valorem* basis as provided for in the Tea amendment Bill 2010.

The major challenges facing TRFK are increasing the adoption of improved technologies to close the gap between research and actual farm yields. The Foundation's efforts to enhance branding, product diversification and value addition are limited by the following challenges: lack of an adaptive tea research factory and other relevant equipment; qualified and experienced personnel in the fields of food science, biochemistry and process engineering; and inadequate exchange of market information. Inadequate processing capacities in Kenyan factories and lack of operational policies and guidelines for intellectual property rights are still a challenge.

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APPENDIX A

Appendix Table A1. Tea production trends at current prices, 2000–10

Year	Tea output	Output value	TBK Cess	Cess as a share of output	TRFK funding as a share of output	Consumer Price Index (2009=100)
		(current Kshs)			(percentage)	
2000	236	35971	109	0.30	0.15	49.89
2001	295	33415	136	0.41	0.20	52.75
2002	287	34306	132	0.38	0.19	53.79
2003	294	33394	135	0.40	0.20	59.06
2004	325	43447	149	0.34	0.17	66.03
2005	328	42863	151	0.35	0.18	72.57
2006	311	47297	143	0.30	0.15	76.95
2007	370	43146	170	0.39	0.20	80.24
2008	346	62200	159	0.26	0.13	92.36
2009	314	69603	145	0.21	0.10	102.09
2010	399	97000	184	0.19	0.09	106.26

Source: TBK (2000–10).

Appendix Table A2. Expenditure trends at the Tea Research Foundation of Kenya, 2000–10 (current prices)

Year	Personnel	Operating	Maintenance	Training	Capital	Total	Consumer Price Index
		(current Kshs)					
2000	26,470,553	36,151,255	10,564,787	2,804,002	12,007,106	87,997,703	49.89
2001	31,247,823	38,387,843	12,829,569	3,060,892	–	85,526,127	52.75
2002	34,578,056	45,669,329	12,413,801	3,191,470	12,453,687	108,306,343	53.79
2003	32,048,929	43,853,070	10,963,098	2,025,486	1,507,844	90,398,427	59.06
2004	36,429,523	33,479,057	7,940,948	1,946,637	3,383,758	83,179,923	66.03
2005	31,868,163	34,993,322	8,779,195	2,512,416	2,975,228	81,128,324	72.57
2006	37,787,265	46,370,429	11,554,730	3,597,654	8,400,534	107,710,612	76.95
2007	40,857,713	46,673,137	11,330,375	2,336,332	6,725,823	107,923,380	80.24
2008	41,759,423	38,416,161	6,902,412	2,026,018	44,695	89,148,709	92.36
2009	44,052,343	34,913,504	12,009,221	1,469,304	669,629	93,114,001	102.09
2010	53,000,598	44,273,060	12,282,642	1,964,217	845,318	112,365,835	106.26

Source: TRFK (2000–10).

Appendix Table A3. Sources of funding for the Tea Research Foundation of Kenya, 2000–10

Year	Taxes	Sales	Consultancy	Donors	Interest	Total	Consumer Price Index
		(current Kshs)					(percentage)
2000	57,958,914	873,346	718,890	–	925,491	60,476,641	49.89
2001	71,947,928	1,840,006	676,068	–	463,819	74,927,821	52.75
2002	83,506,027	2,936,672	593,740	–	277,652	87,314,091	53.79
2003	77,709,060	3,005,388	669,433	–	76,977	81,460,858	59.06
2004	82,094,450	3,346,182	791,931	–	66,229	86,298,792	66.03
2005	67,094,450	3,681,306	887,490	–	134,909	79,682,768	72.57
2006	82,781,925	2,367,333	797,310	–	167,788	75,172,515	76.95
2007	74,979,063	2,344,013	2,316,758	–	55,057	84,843,134	80.24
2008	71,840,084	2,323,958	1,573,870	–	28,165	85,255,207	92.36
2009	80,127,306	3,203,905	1,683,396	17,000,000	15,927	102,030,534	102.09
2010	81,329,214	3,153,172	1,442,035	10,000,000	9,514	95,933,935	106.26

Source: TRFK (2000–10).

The Agricultural Science and Technology Indicators (ASTI) initiative compiles, analyzes, and publishes data on levels and trends in agricultural R&D investments, capacities, and institutional arrangements in developing countries. ASTI is managed by the International Food Policy Research Institute (IFPRI) and involves collaborative alliances with many national and regional R&D agencies.

Jointly convened by ASTI/IFPRI and the Forum for Agricultural Research in Africa (FARA), the conference, "Agricultural R&D—Investing in Africa's Future: Analyzing Trends, Challenges, and Opportunities," brought together experts and stakeholders from the region to contribute their expertise for the purpose of distilling new insights and creating synergies to expand the current knowledge base. The themes under focus were (1) Why African governments under invest in agricultural R&D; (2) How human resource capacity in agricultural R&D can be developed and sustained; (3) How institutional structures can be aligned and rationalized to support agricultural R&D; and (4) How the effectiveness of agricultural R&D systems can be measured and improved.

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