

HERITAGE WEEK CELEBRATIONS

THEME: *“100 years serving Kenyan tea to the rest of the world”*

DATE: 6TH – 8TH November, 2024

VENUE: KARATINA UNIVERSITY, MAIN
CAMPUS

MODE: BLENDED

CONFERENCE ORGANIZING COMMITTEE

1. Dr. D. G. Maina -Member
2. Dr. F. Runji -Member
3. Dr. E. Maina -Member
4. Dr. Louise Ngugi -Member
5. Dr. Emily Kilel -Member
6. Dr. S. Njoroge -Member
7. Mr. P. Ragwa -Member
8. Dr. J.K. Miriti -Member
9. Dr. Pauline Thuku -Member
10. Ms. Dinah Ochami - Conference Secretariat
11. Mr. H. Kimutai - Conference Secretariat
12. Ms. W. Wacheke -CCO

TBK CONFERENCE TECHNICAL TEAM

1. Mr. James Marete
2. Mr. Enock Matte
3. Mr. David Muriuki
4. Ms. Dianah Opiyo

HERITAGE WEEK BACKGROUND

The tea industry makes an important contribution to the Kenyan economy. Tea is among leading foreign exchange earner contributing about 23% of total foreign exchange earnings and 2% of the Agricultural GDP. Annually, the country produces over 450 million Kgs of tea, which earn the country over K.sh 120 Billion in export earnings, and 22.0 Billion on local sales. The industry supports about 5.0 million people directly and indirectly while an estimated 650,000 tea growers depend on tea making the industry one of the leading sources of livelihood in the country. Tea is grown in the highlands located within the West and East of Rift and on higher altitude of between 1,500 metres and 2,700 metres above Sea Level. The highlands are spread across 19 tea-growing counties that include Nakuru, Narok, Kericho, Bomet, Nyamira, Kisii, Kakamega, Bungoma, Vihiga, Nandi, Elgeyo Marakwet, Trans-Nzoia, Kiambu, Murang'a, Nyeri, Kirinyaga, Embu, Tharaka-Nithi, and Meru.

Kenya tea is renowned world-wide for its quality and safety due to adherence to the industry adherence to good agricultural practices (no pesticides or agro-chemicals); good husbandry practices and selection of high quality varieties; skillful processing practices (no additives, preservatives or artificial colouring); continuous improvements due to investment in modern technology and R&D; commitment to Global and National Food Safety standards (ISO, HACCP, KS1927) as well as compliance with environmental and social market requirements (ETP, Fair Trade, Rainforest Alliance e.t.c).

The history of Karatina University (KarU) dates back to 1957 when the British Government established a Tea Farming Training Center, in Central Province, Kenya. After Kenya independence, Kenya Tea Development Agency (KTDA) established the facility with a hope of offering training in the field of tea. The current university started as a campus of Moi University on the KTDA facility in 2007. It was chartered as a fully-fledged university in 2013. The University is strategically placed to offer courses in Tea agronomy, Processing technology, Management and Trade because it has a team of interdisciplinary academic and non- academic staff with knowledge and skills on tea along the entire value chain. It has a well equipped tea processing facilities and owns a tea farm.

The Tea Board of Kenya is a corporate body established under the Tea Act, 2020. The board is charged with the responsibility of developing, promoting and regulating the tea industry. It is mandated to license tea manufacturing factories; carry out research on tea; to register growers, buyers, brokers, packers, management agents and any other person dealing in tea; and promote Kenya tea in both the local and the international markets. The Board also disseminates information relating to tea and advises the Government on all policy matters regarding the tea industry.

The Tea Board of Kenya together with her partners has organised the Centenary Tea Celebrations to celebrate 100 years of commercial tea production in Kenya. The Celebrations has been The celebrations have been dubbed "Tea Heritage Week" being held from 6 -8th November 2024.



Prof. Linus Muthuri Gitonga (PhD MSc BEd Sc. Hons); Vice Chancellor

Is a Professor of Entomology, in the Department of Biological Sciences, School of Pure and Applied Sciences, Karatina University. He specializes in biological control and Integrated Pest Management (IPM). Prof. Gitonga specializes in applied Entomology in areas such as insect species identification, population dynamics; and indigenous biocontrol agents namely Anthocorid bugs (predator) and Ceranisus (parasitoid). In his academic and managerial leadership, Prof. Gitonga is an organized supervisor, mentor and coach who is able to effectively assess, analyze needs and provide tools to solve problems, enhance learning and improve performance. In addition, he is skilled in team building and forging relationships with individuals from diverse cultures, backgrounds and nationalities. Prof. Gitonga is ranked in AD Scientific Index rankings; Kenya Scientist and University Rankings; AD Scientific Index rankings; and Kenya Scientist and University Rankings. Is a member of Entomological Society of America (ESA) and Association of African Insect Scientists (AAIS). He has done collaborative projects in various areas including ICIPE, KARI, Philips University Germany, KEMRI, Sun Agro biosystem ltd of India, JKUAT, ITROMID, University of Nairobi, and Egerton University. Prof. Gitonga's community service involvement include identification of agricultural pests, Beneficial insects and their management (SACDEP); Community Capacity Building Initiative: Resource person/consultant; ICIPE: Training of farmer groups and training materials development/consultancy.



Dr. Samson Kamunya

Dr. Samson M. Kamunya is currently the Director, Biotechnology Research Centre of Kenya Agricultural & Livestock Research Organization (KALRO-BioRC)), where he is overseeing the Centre's biotechnology research activities and related events. Prior to joining BioRC, he worked as the Director of KALRO-Tea Research Institute, where he oversaw the general administration and management of the Institute, implementing Organization's policies, strategies and plans and developing and implementing tea programmes and projects. He has also been responsible for pursuing partnerships and collaborations between national and international organizations with similar interests in tea research, validation and commercialization of innovations and technologies associated with climate change adaption and mitigation strategies. As a plant breeder, he has developed over 1000 new tea clones, which are currently in different stages of evaluation for high yields, high quality diversified novel tea products and tolerance to biotic and abiotic stresses. Of these tea cultivars, he has released, for commercial use, fifteen (15) high yielding tea cultivars suitable for manufacture novel specialty tea products, including orthodox purple, green, yellow, black, oolong and white teas and silvery needles, besides the traditional black Cut, Crash and Curl (CTC) tea, for which Kenya is globally known. He is currently leading the KALRO Tea Research team in the Global Low Carbon Tea - Triangular Cooperation in Tea Value Chain in Kenya (GLI-TEA Kenya), focussing on Research on adoption at production stage of suitable low-carbon technologies and practices for Kenya tea in close collaboration with the Food and Agriculture Organization (FAO) of the United Nations, Kenya Tea



Development Agency (KTDA Foundation) and Tea Research Institute of Chinese Academy of Agricultural Sciences (TRICAAS). Before joining KALRO, he worked as Scientific Officer with the Centre for Agriculture Biosciences International (CABI), Africa Regional Office, on biocontrol of conifer aphids and integrated control of *Leucaena psyllid*. Samson holds BSc (Forestry), M.Phil (Forest Genetics), Moi University and D.Phil (Agronomy-Plant Breeding), Egerton University.



Mr. Festus K. Kaburi

Mr. Festus Kaburi has 28 years' experience in the tea industry, He has worked in tea factories manufacturing CTC tea, Orthodox tea and specialty teas. He has strong passion in adopting and implementing new technologies, ideas and projects that create positive environment for improved livelihood of the small holder tea farmer, under the umbrella of Kenya Tea Development Agency (KTDA). He has actively participated as a team member or as a leader in development of new knowledge, innovations, new products and technologies, systems and linkages that add value to the tea industry. Currently, he has been overseeing the development and growth of orthodox tea manufacture and specialty tea manufacture as a diversification strategy for KTDA. KTDA orthodox tea is now the benchmark for Kenya producers. Festus is a trainer and gets involved in capacity building for orthodox tea manufacture, specialty tea production and value added tea products for the industry producers organized by Tea Board of Kenya. He is an active member of Purple and Speciality Tea Association of Kenya (PSTAK) where he is the current vice chairman. Through PSTAK he is involved in the development of specialty tea sector in Kenya, including promotion of consumption of the specialty tea.



Dr. Dennis Maina

Is a Horticulturist, Applied Nanotechnologist and Lecturer at Karatina University. Dennis is the current Tea Institute Director. I am certified Tea Master (Zhangzou College of Science and Technology) and a former Assistant Manager in KTDA. Also a consultant in sustainable agriculture, ethical tea practices Organic Farming, Good Agricultural Practices, Greenhouse Farming, Food Safety Management System, Quality Management System and Safe Use of Agrochemicals. My research skills are in application of organic nanopolymers and use of biological agents in solving agricultural challenges to increase food quality and quantity with maximum environmental care.



Dr. Emily Cherono Kilel, is a lecturer in the Department of Food Science and Nutrition at Karatina University and a member of Karatina University Tea Institute. Dr. Kilel did all her postgraduate research on Purple tea and has published widely on the same. She has worked in various Tea Companies of Ekatera and KTDA and has also served in the ministry of Livestock and Development as a Production Officer. She has also served in the Tea Technical Committee where she participated in drafting of Purple Tea Standard.



Dr Louise Ngugi Holds a PhD and a Masters in Applied Human Nutrition from UON- Kenya. She has been the lead consultant in baseline and end line surveys as highly qualified professional in food and nutrition security, Public health nutrition, water, and sanitation and hygiene, disaster mitigation and risk management programmes. She has expertise in behaviour change communication having coordinated behaviour change programme for youths coupled with having an education background. She has additional trainings such as in food and nutrition security, research ethics and proposal writing, ecosystems for poverty alleviation, leadership in nutrition, among others. Her PhD and masters studies focused on nutrition and hygiene in disease management mainly nutrition education with empowerment and knowledge attitudes and practices on traditional vegetables by youths respectively. She has experience in food products development for wellness, disease prevention and management. Some of the products include; Kombucha Tea, Tea Moringa yoghurt among other tea confectionaries.



David Muriuki – Ag. Deputy Director – Trade Advisory (Tea Board of Kenya)

David is a Certified Tea Specialist from Zhangzhou College of Science & Technology (China), with over 15 years in the International Tea Trade and Marketing having joined the Tea Board of Kenya in May 2009. He holds a Master's Degree in Business Administration (MBA) – International Business and a Bachelors of Commerce degree (B.COMM)- Marketing/Management. David is an Alumni of the Catholic University of Eastern Africa (CUEA). He holds a post graduate Diploma in Marketing and is a Full Member of the Marketing Society of Kenya (MMSK), A member of the Kenya Institute of Management (MKIM). He also holds International Trade Centre (ITC) certification in Trade Facilitation. David is a Marketing Expert with extensive experience in Tea Export Market Development and Promotion with key focus in developing International Tea trade promotional strategies, coordination of market development activities, product development and repositioning Tea brands for specific niche markets.



Dr. Flora Runji is a University Lecturer in the School of Pure and Applied Sciences at Karatina University where she has been a faculty member since 2012. She holds a PhD in Pure Mathematics from Moi University, an MSc degree in Pure Mathematics from Kenyatta University as well as a Bachelor in Education degree from Kenyatta University. Dr. Flora has research interest in Mathematical Analysis, Mathematical Coding and is currently diversifying her research base to Data Science and Machine Learning. Dr. Flora is a member of the Tea Institute technical committee in charge of Tea Curricula.



THEME: 100 years serving Kenya tea to the rest of the world

Day One: Wednesday, 6th November, 2024

Tea Series (Scientific Presentations)

Moderator: Dr. Flora Runji, Karatina University

VENUE: New Library Complex

TIME	ACTIVITY AND FACILITATOR/SPEAKER	CHAIR/RAPPORTEUR
08:00-09:00	Registration	Secretariat
	Arrival of guests Courtesy call VC's office	Director tea Institute -Dr Dennis Maina
	Opening Prayer : Dr. Father Muthee	Dr. L. Ngugi and Rapporteur: TBK Rep
09:30- 9:35	Welcome Remarks Prof. H. Kamiri Ag. Deputy Vice Chancellor (ARSA)	
09:35- 9:40	Introduction Dr. Dennis Maina; Director, Tea Institute & Chairman, Conference Organizing Committee, Karatina University	
09:40- 9:45	Background Mr. James Marete; Director, TBK & Co-Chairman, Conference Organizing Committee	
9.45-10.05	VC Remarks Prof. Linus M. Gitonga Vice Chancellor, Karatina University Invites TBK CEO	
10:05 - 10:25	TBK CEO REMARKS INVITES TBK Chairman	Session Chair: Dr. Louise Ngugi, Rapporteur: TBK
10:25-10:45	TBK Chairman Invites PS Agriculture	
10.45-11.05	PS Agriculture Invites chief guest	
11.05-11:25	Speech: Chief Guest Official Opening by the Chief Guest (PS HERITAGE)	
11.25 – 11.35	Group photo	
11.35 – 12.00	Tea Break	
12.00 – 12.20	Keynote Speaker: Dr. Samson Kamunya Topic: Tea Improvement in Kenya. A review	
12.20 – 12.40	Keynote Speaker: Dr. Arthur Rimberia Topic: Tea Packaging, Transportation and Warehousing	



12:40-12.50	Q&A	
12.50-1.30	Aboretum and exhibitions walk	
1.30-2.00	Lunch	
2.00-2.10	Energizer Poem Sharon Karuri	
2.10-2.20	Speaker: Prof. Margaret Mwenje Director Community Outreach, Karatina University Topic: Tea and Wellness	Session Chair: Dr. S. Njoroge Rapporteur: Dr. Kinya Miriti
2:20 -2:30	Speaker: Dr. Dennis Maina, Karatina University Topic: Challenges and Opportunities of Organic Tea Farming in Kenya	
2:30-2.40	Speaker: Mr. Kanyi Ready to drink teas. A strategy for Youth Mainstreaming in tea drinking culture	
2.40 – 2:50	Q&A	
2:50-3.00	Speaker: Dr. Kilel Tea Processing Technologies in Kenya- the Milestones	
3.00-3.10	Speaker: Dr. Esther Maina Competitive strategies for global market leadership of Kenyan tea	
3.10-3.20	Dr. Macharia Influence of Financial Literacy on economic sustainability among Small-Scale Tea Farmers in Kenya, A Case of Ndima Tea Factory, Nyeri County	
3.20-3.30	Q&A	
3:30-3.50	HEALTH BREAK	
3.50-4.00	Speaker: Dr Louise Ngugi, Karatina University Topic: Analytical assessment of a composite yoghurt of tea and <i>Moringa oleifera</i>	Dr. Kinya Miriti Ms. Dinah Ochami/ TBK Rep
4.00-4.10	Speaker: Dr. Kagema The Contribution of the Tea Industry in the Realization of the Sustainable Development Goals in Kenya	
4.10 – 4.20	Closing Remarks	
3.00 – 6.00	Students Site visits (HORERA FOREST EDGE LTD)	
Day Two: 7th November, 2024		
Session Chair: Mr. James Marete Rapporteur: Dr. Emily Kilel VENUE: New Library Complex		
08:30 – 09:00	Registration	Secretariat
09:00 – 11:00	Visit to Ragati Tea Factory	Dr. Dennis Maina
11:00-11:30	Arrival at Karatina University	Mr. Hillary Kimutai/ TBK Rep



11.30-12.00	TEA BREAK	
12.00-12.10	Spoken Word	
12.10-12.40	<i>Mr. Danstun Ngumo</i>	
12.40 – 1.10	<i>Boaz</i>	
1.10 – 1.20	Q&A	
1.20 – 2.00	LUNCH	
2.00 – 2.30	<i>Speaker: Mr. Festus Kaburi Specialty Mgr, KTDA</i> <i>KTDA story</i>	<i>Dr. Flora Runji</i>
2.30-3.00	<i>Chairman Siret factories</i>	<i>TBK</i>
3.00-4.00	<i>Open Forum (Challenges, Opportunities and Communique)</i>	
4.00-4.20	HEALTH BREAK	
3.00 – 6.00	Students Site visits (KANGAITA TEA FACTORY/ TRI)	3.00 – 6.00

Day Three: 8th November, 2024

Session Chair: Mr. Enock Matte		
Rapporteur: Mr. Hillary Kimutai		
VENUE: University Pavillion		
08:00 – 11:00	K24 Show Live Broadcast	MEDIA MAX
11:00 - 12:00	<i>Launch of Tea curriculum</i> VC Karatina University/ CEO TBK	
11:10 - 2:00	Influencer Activation & Interactive Session with Students	MEDIA MAX
12.00 – 1.00	Gifts and Awards	
2.00-5.00	DJ Session & Mini Concert	



Vice Chancellor's Speech at Karatina University's Heritage Week Celebrations

Celebrating 100 Years of Kenya's Tea Heritage

Distinguished Guests, Esteemed Colleagues, Partners from the Tea Board of Kenya and the Tea Institute, global tea community, the Karatina University Community and Friends,

I am truly honored to welcome you all to Karatina University as we celebrate a remarkable milestone: 100 years of Kenya's legacy in tea production and service to the world. This Heritage Week is particularly special because it commemorates our nation's journey as a tea producer of global repute. It's a journey that has shaped not only the landscapes of Kenya but also its economy, cultural heritage, and global standing.

Today, as we gather at Karatina University, home to Kenya's renowned Tea Institute, we celebrate both the proud history and the promising future of Kenyan tea. The presence of our esteemed partners from the Tea Board of Kenya and other industry stakeholders is a testament to the strong ties between academia and industry. Together, we are working towards advancing Kenya's tea sector and securing our place in an ever-evolving global market.

As Karatina University, we are deeply proud of our unique position in the advancement of the tea sector in training, research, innovation, and sustainable practices. The history of Karatina University (KarU) dates back to 1957 when the British Government established a Tea Farming Training Center, in Central Province, Kenya. After independence, Kenya Tea Development Agency (KTDA) established the facility with a hope of offering training in the field of tea. The University is strategically placed to offer courses in Tea agronomy, Processing technology, Management and Trade because it has a team of interdisciplinary academic and non-academic staff with knowledge and skills on tea along the entire value chain. It has a well equipped tea processing facilities and tea farm for research and innovations related to tea. The University is currently promoting diversified tea products such as: Tea Yoghurt, Tea Confectionaries, Tea Detergents, Tea shoe polish, tea oil etc. The University is also training farmers on organic tea production for sustainability. We are committed to developing industry-ready graduates who will contribute to the tea sector and uphold Kenya's legacy in tea production.

Finally,

let us remember that every cup of Kenyan tea enjoyed around the world represents the dedication, resilience, and excellence of countless individuals. It is a product of our shared heritage and a symbol of our nation's strength and beauty. Let us celebrate this milestone with pride, and let us commit to a future where Kenyan tea continues to flourish on the global stage.

Thank you for being here, and thank you for your commitment to Kenya's tea industry. May this Heritage Week inspire us all to keep working for a future that honors our past and embraces the boundless possibilities ahead.

Thank you.

Prof. Linus M. Gitonga

Vice Chancellor

1. Tea Improvement in Kenya: a review

*Kamunya, S.M., ¹Chalo, R.M., ¹Maritim, T.K., ¹Kerio, L.C. and ²Wachira, F.N.

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Abstract: The review presents a detailed account of tea improvement efforts in Kenya since first introduction. Although tea was introduced in Kenya at the turn of 20th century, concerted efforts in tea improvement could not take root until in the early 1960s after the country gained self-rule from Britain. Owing to heterogeneity of pioneer seedling populations that was accompanied by management constraints, early research effort resulted in development of single-whole cuttings as propagation materials, which coupled with clonal selection led to release and commercialization of high yielding and quality clones. This resulted in rapid expansion of Kenyan tea industry. To date a total of 58 high yielding and good quality tea cultivars have been released for commercial utilization. Kenyan tea industry which almost solely entails export of black CTC (Cut, tear and curl) tea is currently experiencing problems as a result of global annual over production and effects of climate change. To counter declining revenue base from tea enterprise efforts to undertake value-addition and product diversification have been initiated. Further, tea improvement activities integrating molecular markers and participatory clonal evaluation and selection involving farmers and consumers are expected to fast-track development and adoption of novel varieties within a relatively shorter period. Studies earmarked at combating climate have been initiated with the ultimate aim of employing low to neutral carbon tea production practices and technologies for the sustainability of Kenyan tea industry.

Keywords: *Camellia sinensis*, tea, breeding, Kenya

2. Tea Processing Technologies in Kenya- the Milestones

Emily Kilel, Karatina University, P.O. Box 1957,10101, Karatina

Abstract

Tea was introduced to Kenya at around 1903 by white settlers and the tea commercialization picked in 1924 where the first tea estates exclusively owned by white settlers were established. A desktop review was done to look at the milestones in tea processing. It was observed that between 1930 and 1970, tea plucking was basically hand plucking and orthodox method of processing was used. In the early 1930s, tea growing and production was expanding globally leading to overproduction, affecting tea prices. This led to the introduction of international tea growing expansion restriction scheme signed under the first Tea Agreement in Amsterdam in 1933 affecting Kenya which had about 4,800 hectares under tea and was subjected to the same expansionary restrictions being major tea growers in the world. At around 1940, the tea farming in Kenya got organized culminating to formation of the Tea Board of Kenya in 1950 to regulate the tea industry. In 1954 smallholder tea cultivation commenced under the Swynnerton Plan with the first small holder tea factory established in Ragati, Nyeri County in 1957. Orthodox method of processing was still common then. Soon as the Country attained its independence

in early 60's, more tea factories were built and by 1970, Cut Tear Curl (CTC) method of processing was introduced following the expansion in tea cultivation. Value addition started in 1978 when Kenya Tea Packers (KETEPA) was established to package and market Kenyan teas locally which promoted local consumption. Through 1980 and 1990 tea processing improved via mechanization and by 2000, the Kenyan tea industry embraced sustainable practices, with factories implementing eco-friendly initiatives such as rainwater harvesting, waste reduction, and renewable energy sources. The industry also focused on diversifying product offerings to include green tea, flavored teas, and specialty teas like purple tea. Automation was adopted in tea processing where continuous fermenting unit were used replacing the use of trolleys, batch method of fermentation. With tea falling prices due to over production, value addition with intentional rebranding is key in ensuring increased earnings from tea business.

Key words: Orthodox; KETEPA; KTDA; CTC; value addition

3. Challenges and Opportunities of Organic Tea Farming in Kenya

Dennis Gatahi; Karatina University

Abstract

Tea (*Camellia sinensis* Kuntze) is the most important member of the Theaceae family. The plant is mainly grown for beverage, economic, environmental conservation among other uses. Tea was introduced by the British settlers in Kenya in 1903 but was not commercialized until 1924. Kenya is the 3rd largest producer and biggest exporter of tea globally. In addition, Kenya is known for high quality teas with revenue from tea export accounting for over 1.5 million USD annually. Despite the huge potential in Kenyan tea, the country faces serious challenge in profitability of processed tea. The depressed returns are partly attributed to lack of value addition, high cost of production particularly labour, over-reliance in the traditional market destinations, limited domestic tea consumption and lack of proper branding of the tea among other challenges. This review paper aims at exploring the potential of organic tea as way of increasing the value of Kenyan tea owing to the increased consumer awareness, need sustainable tea farming and high input cost particular the compounded chemical fertilizer NPK 25.5.5. Currently the global market value for organic tea standard at 905 million USD with an annual growth rate of 10%. Most farmers are unable to adopt organic tea farming (60%) due to lack of awareness, limited demand by processors for organically grown tea (30 %), inadequate information on the process towards organic farming (40 %), limited knowledge on formulation of alternative organic farm inputs such as composting (20%) and stringent requirements for organic certification (50%). This paper packages the value of organically grown tea, market potential, alternative source of plant nutrition products, steps towards organic certification and stimulates the need for processors to venture in organic tea production for niche markets.

4. Impact of the Tea Industry on Family Well-being in Kenya

Prof. Margaret Mwenje; mmwenje@karu.ac.ke

Abstract

Globally, Kenya is the third-largest tea producer after China and India. The small-scale tea producing sector accounts for over 60 per cent of total production while the remaining 40% is the large tea plantation estates.

There are approximately 180 registered tea processing factories in Kenya serving over 400,000 tea growers. Consequently, the tea industry plays a critical role in providing livelihoods for families by contributing to household income. This paper examines the multifaceted impact of the tea industry on family wellness both directly and indirectly. The tea industry is a significant economic driver in many tea-growing areas across the globe. As a significant source of employment, the tea industry presents families with improved housing, healthcare, education, and infrastructural development. Large tea estates may invest in community infrastructure, like roads, schools, and clean water, benefiting families' well-being. Tea is one of the most commonly consumed beverages in Kenya and in many other countries. Black and purple tea with its newly found nutritional value helps to support family health. This paper will also explore some challenges in the tea industry that affect family well-being negatively. The fluctuating tea market prices and the seasonal nature of tea production result in economic instability which in turn affects family wellness in many ways. Financial instability and the pressures of physical Labor can impact mental health, leading to stress within families. Additionally, the physical demands of tea cultivation and processing may pose health risks to farmers, while access to healthcare services may be a challenge. This paper focuses on economic, health, educational, and social dimensions of family wellness. By synthesizing these dimensions, the paper aims to provide a comprehensive understanding of how the tea industry influences family stability and overall well-being, contributing to ongoing discussions about sustainable economic development in Kenya.

Keywords: Tea Industry, Family Wellness, alternative livelihoods

5.

Kaburi Festus K¹.; John M. Waithira²; Ndiga Kithae³, Audrine M. Ileri⁴

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ABSTRACT

Tea was discovered in 2737BC, accidentally, by an emperor in China. 4,640 years later, i.e. in 1903, tea was introduced in Kenya by the white settlers in Limuru, Kiambu County, on experimental basis. After successful experimentations, the colonial government allowed commercial growing of tea in 1924 by large estates. Tea board of Kenya was later formed to regulate the tea industry. The small holder tea cultivation commenced in 1954 leading to establishment of the first small holder tea factory in 1957, Ragati tea factory in Nyeri County. To promote the development of cash crops, which were regarded special crops, the government established a Special Crops Development Authority in 1960. As more farmers got interested with growing tea, there was need to have a focus on tea separate from other special crops. The new government after independent established Kenya Tea Development Authority (KTDA) in 1964. This was a government parastatal under the ministry of agriculture. Government employees in the ministry were trained on tea growing and seconded to KTDA to offer tea extension services to support farmers in adhering to the strict practices required in establishing tea farms. This was to ensure the green leaf to be harvested was of very high quality standard. The popular **“two leaf and a bud”** leaf quality standard was coined and has been the backbone of the quality tea associated with the KTDA small scale tea farmers todate. In 1999 KTDA was privatized and in the year 2000 a private entity, Kenya Tea Development Agency Ltd, was established. The Agency took over the management of the small holder tea sector. By maintain the initials **“KTDA”**, it ensured smooth transition without affecting the tea buyers'/consumers perception as KTDA had already become a global brand associated with high quality made tea. Small holder tea farmers took full control of KTDA and as Laws and regulations changed they continuously restructure as necessary. Farmers saw the need for KTDA to venture into more businesses in the value chain, hence the Agency

was renamed and registered as Kenya Tea Development Agency Holdings Ltd. Separate subsidiaries were established by the Holdings company to manage specific business areas. Today KTDA H Ltd has established 9 subsidiaries, manages 71 factories and has close to 700,000 small holder tea farmers. The KTDA model of managing small holder tea sector has been noted as unique worldwide and researchers and scholars need to document it as a successful model.

Key Words: *Small Holder Tea farmer, KTDA.*

6. Influence of Financial Literacy on economic sustainability among Small-Scale Tea Farmers in Kenya, A Case of Ndima Tea Factory, Nyeri County

Stephen Macharia Muriu and Paul Kiumbe, Karatina University

Abstract

Financial literacy plays a critical role in empowering individuals to make informed decisions regarding their income, savings, credit, and investments. For small-scale tea farmers in Kenya, financial literacy is particularly relevant due to the seasonal nature of agricultural income and the need for long-term planning. This study was an assessment of financial literacy levels among small-scale tea farmers in Kenya and particularly those served by Ndima Tea Factory in Nyeri County. The specific objective is to evaluate farmers' understanding and application of essential financial concepts such as savings, budgeting, credit usage, and investment to determine their ability to manage tea-related income effectively. The study is guided by **Human Capital Theory and Financial Capability Framework**. The study applied descriptive research design since it enables collection of qualitative and quantitative data. The population composed of 8202 tea growers served by the factory. A sample of 381 was used and purposeful random sampling approach was employed to ensure that participants reflect diverse socio-economic backgrounds while targeting farmers actively engaged with the factory. Data collection involved surveys and structured interviews, capturing both quantitative and qualitative insights. Findings on savings indicated that 60% of farmers save with banks, 30% with SACCOs and Chamas. On budgeting, 41% indicated they budgeted for household and farm inputs while 40% budgeted for loan repayments. On financial literacy, 75% of respondents indicated having serious challenges. The outcomes provide actionable recommendations for the farmers and other stakeholders, including the Kenya Tea Development Agency (KTDA), financial institutions, and NGOs, to develop targeted training programs geared towards improving farmer's financial literacy. This research contributes to the broader conversation on financial inclusion in agriculture, emphasizing the need for sustainable financial education to empower rural communities and promote long-term economic well-being for tea farmers in Kenya.

Key Words: financial literacy, savings, budgeting, credit usage, investment

7. Optimization of tea attributes in a composite yoghurt with *Moringa oleifera*

L.W. Nguji, Karatina University

Coack tail drink of Yoghurt, *Moringa oleifera* and tea will delivery multnutrients to address various nutrient deficiencies while enhancing consumption of *Moringa oleofera* and tea. Moringa elsewhere referred to as the miracle tress is rich in minerals, vitamins and other essential phytochemicals. When used in children above six months old it may be useful to treat malnutrition. It has health benefits and contains antioxidant, anticancer, anti-

inflammatory antidiabetic and antimicrobial properties. The consumption of *Moringa oleifera* and its products in its own Africa is low Kenya included. Despite tea being an old cash crop in most of the regions in Kenya, the consumption of tea is also low at about 5 %. Tea contains polyphenols that may contribute to its antioxidants and anticancer properties. Tea is associated with improved heart and gut health and prevention of certain chronic illness. A cross-sectional analytical design will be suitable utilizing structured questionnaires to obtain information on knowledge and preferences of *Moringa oleifera*, tea and yoghurt. Development of products with different proportions of moringa oleifera and tea will be taken through sensory evaluation of the same. For identification of the most preferred product. Obtained data will be analyzed for mean scores, differences across the different proportion. The study population will engage Karatina university students and staff who are representative of the youth middle and adults in middle and later ages. This concept is multipronged enhancing consumption of moringa oleifera and tea in yoghurt as the vehicle being a commonly consumed product. This offers a synergistic solution to nutrition and health issues while promoting consumption of diverse products.

Key Words: Green tea, *Moringa oleifera*, yoghurt.

8. The Contribution of the Tea Sector in the Realization of the Sustainable Development Goals No. 1, 2, 8 and 13 in Kenya

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The tea sector globally has contributed to social economic transformation and empowerment of the people. Tea is one of the most popular non-alcoholic beverage in the world and also a top producer. Agenda 2030 for Sustainable Development calls for a new paradigm to a plan of action for people, planet and prosperity. Importantly, it anchors to eradicate poverty in its extremities and proactively provide a clarion call to a sustainable world that will provide a transformative path for societies. This is amidst the global reawakening to the ravages of climate change to humanity and entire ecosystems. In the realization that tea is an important crop in this journey, this paper explores the contributions that the tea industry in Kenya has underscored to realize a sustainable world and the attendant goals including Kenya Vision 2030. We analyze the significant contributions of Goal No. 1 on how the tea sector has contributed to end poverty in all its forms, Goal No. 2 on ending hunger through doubling agricultural productivity and incomes of small-scale producers, Goal No. 8 on promoting sustained, inclusive and sustainable economic growth, full and productive employment and decent work and finally Goal No. 13 on urgent action to combat climate change by promoting developments in renewable energy. Fundamentally, the paper underpins a strategic focus by the players in the tea ecosystem to help provide a sustainable action for the present and posterity.

Key Words: Ecosystem; Sustainable Development Goals; Tea; Transformation