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Economic Analysis of the Coffee Market in Rwanda

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Authors' contributions

The sole author designed, analysed, interpreted and prepared the manuscript.

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ABSTRACT

Coffee contributes significantly to the economy of Rwanda as a major export product and the livelihood of thousands of Rwandans. As such, the government of Rwanda has taken great strides to develop the coffee production sector particularly in developing infrastructure impacted by the genocide and implementing policies to ensure sustainable growth. This study aimed to give an economic analysis of the coffee market in Rwanda. It examined the factors affecting the coffee market and identified the major in the market globally and regionally and used them as a benchmark for comparison. The study showed various measures being taken to increase the quantity of coffee produced including increasing the area of harvested coffee following a drop in area from a high of 55 000 hectares in 2014 to 21 700 hectares in 2019. Rwanda's National Agricultural Export Board implemented measures to improve yields and production quality through providing fertilizers, improving management of wash stations and engaging private stakeholders and NGOs to train farmers in smart agriculture techniques. Consequentially the quantity of coffee produced and exported improved between 2014 and 2019.

Keywords: Coffee marketing; coffee processing; agriculture production; agricultural export; economic growth.

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1. INTRODUCTION

Coffee is one of the most popular beverages in the world and in most countries is an integral part of food culture. It is derived from the coffee bean, a seed of the Coffea plant. Coffee is one of the most traded commodities globally and its market size has grown by over 190% since 1964 with a rise from 57.9 million 60kg bags of coffee consumed in 1964 to 109,9 million bags in 2019 [1,2]. The coffee market is currently valued at over US$104 billion and has a revenue expected to be over US$433bn in 2022. The market is expected to grow annually by 4.5% [3]. The demand for coffee has been impacted positively by favourable demographics with the world population growing from 5.7 billion to 7.8 billion people in the period 1995-2020. Rising per capita income and a cultural shift in traditionally tea-drinking nations resulting in an uptake in coffee consumption have also contributed significantly to the rise in demand [4].

The economic disturbances brought about by the COVID-19 pandemic threatened the future of coffee production, trade, retail and consumption with questions asked of its resilience and adaptability (ICO.2020). A 2020 survey of International Coffee Organisation (ICO) exporting members determined that COVID-19 interruptions presented an unforeseen shock to both supply and demand and had the potential to cause definitive closure of many farms with a consequent destruction of local coffee economies [5,6]. For example, stringent COVID-19 rules e.g. lockdown, travel restrictions and social distancing in hotels, bars and restaurants handicapped the sales of coffee which had negative impacts in the value chain right back to the producer. However, with the pandemic coming to an end and the panic associated with it dissipating globally, much more focus has been put on achieving growth in all aspects of the coffee value chain. This is of particular interest to Rwanda, a country where more than 75% of the labour force comes from the agriculture sector of which coffee is a key crop. Furthermore, a significant share of Rwanda's export earnings is derived from coffee (International Development Finance Corporation, n.d.).

Unfortunately, the COVID-19 disruptions were not the first significant disruptions to hit the Rwandan coffee sector. Rwanda's coffee industry reached near collapse in 1990 due to insufficient amount of cherries to attract demand from off-taker and inadequate quality to attract premium price from global buyers [7,8]. This was further compounded by a loss of infrastructure during the 1994 genocide. Since then, measures have been taken to facilitate growth. The Rwandan government committed to reshaping the coffee sector. They addressed the key challenges besetting the sector which included the absence of a long term vision, lack of knowledge of the global market, no skills, minimum technology adoption and lack of coordination amongst key actors in the value chain [9,10]. Emphasis was put on a two pronged strategy. The first was set at improving technology and production while the second focused on skills and quality development.

In 2002 the Rwandan government implemented national coffee strategy to position Rwanda as a specialty coffee producing country.They worked extensively with the private sector and international donors in their endeavour to ensure Rwanda's status as a specialty coffee producer was solidified. As a result, the regulatory framework of the sector which was once in shambles was modified, infrastructure was developed and through consultations with donors market links were developed between producers and foreign buyers

Currently, Rwanda's coffee, which was once known as Rwanda ordinary coffee, is well known for its consistently high quality in the global market. According to the Rwandan Development Board (RDB) the types of coffee grown in Rwanda include Caturra, Catuai, Bourbon (Arabica) with varieties like Harrar; POP3303/21; Jackson 2/1257; BM 139; BM 71.In 2020 Rwanda produced 20 459 tonnes of coffee from a harvested area of just above 17 000 hectares (FAOSTAT). While these are fairly insignificant figures (Ethiopia produced 584 790 tonnes in the same period) Rwanda's coffee has won international awards such as "Best of the Best" and "Coffee Lover's Choice" in a competition that attracted brands from nine countries around the world and was named among the top 10 winners of International Barista Championship that took place in China, 2019 (RDB.n.d) [11,12].

The economic analysis of the coffee market in Rwanda was prompted by the importance of coffee to Rwanda's agriculture economy and how it is imperative that measures be put in place to safeguard the sector from the impact of major events like COVID-19 .The information derived from this research will assist farmers and authorities e.g. government in understanding trends in the coffee market and offer a knowledgeable platform for the formation of national policy which can develop and improve the sector while creating much needed resilience [13,14].

2. METHODOLOGY

The researcher opted to use conclusive research design with a positivism approach. Only quantifiable information obtained through observation and measurement is useful [15]. Secondary data was used to analyse the performance of Rwanda's coffee in the period under study and the performances of other countries in Africa were used as a benchmark and a comparative tool. This was done using a quantitative approach as the international coffee market, imports and exports, area harvested, value and competitiveness were analysed. Key economic and demographic characteristics of Rwanda were used as a background to the study. This information was derived from material published in research reports, journals, dissertations and government data. The analysis was done using descriptive statistics. Data collected through secondary research was summarised and presented in graphs to portray the key characteristics over the period under study.

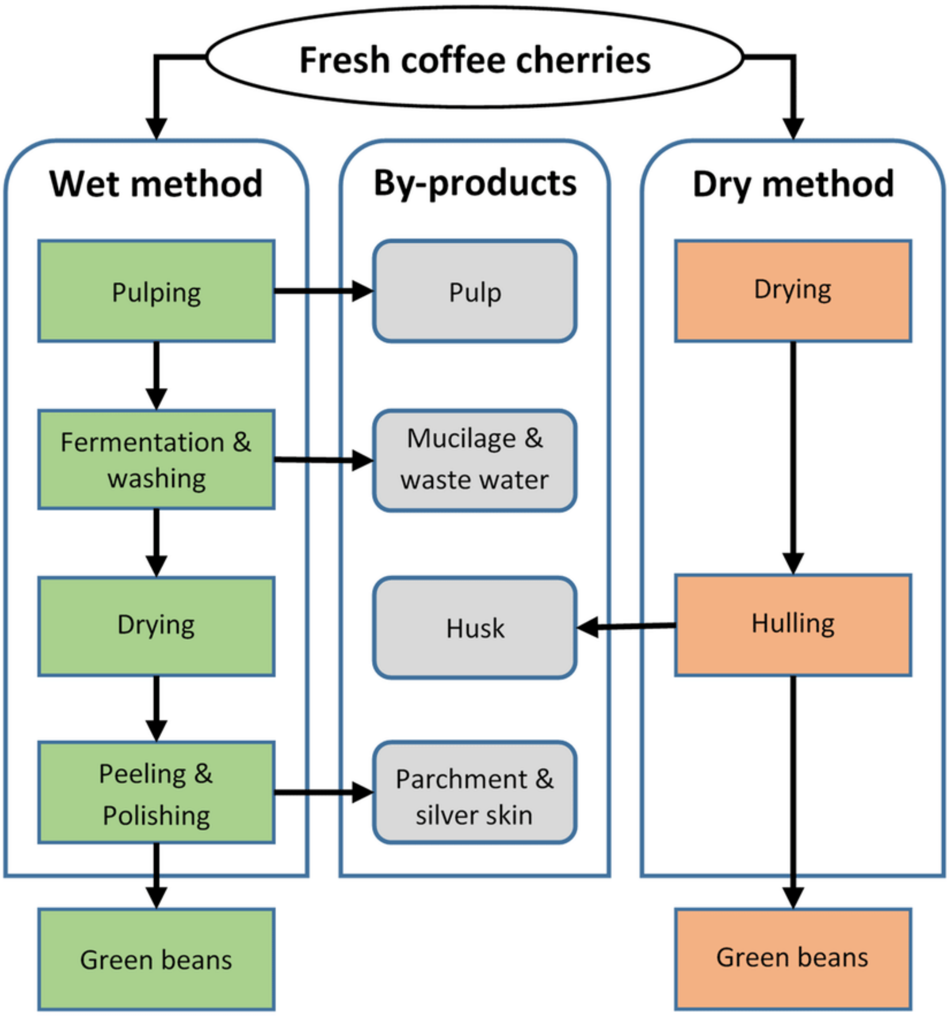

Fig. 1. Coffee drying methods

Source: Chala, Bilhat & Oechsner, Hans & Latif, Sajid & Müller, Joachim [3]. Coffee processing pathways to produce green beans

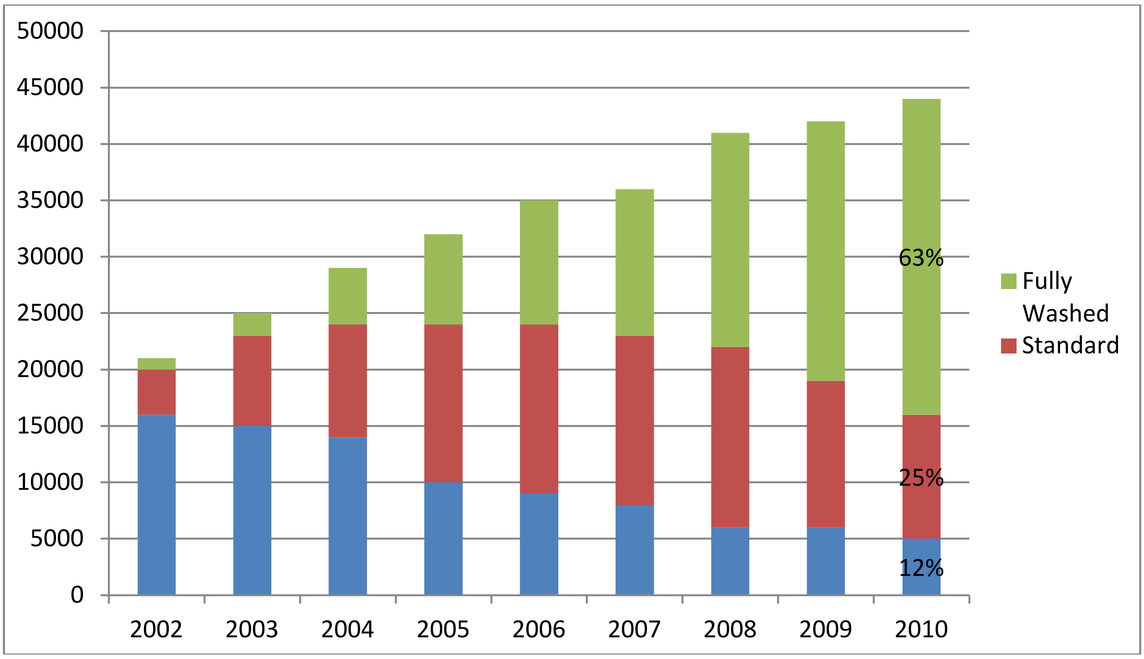

Fig. 2. Quality of coffee in RwandaNational Coffee Strategy targets for washed coffee
Source Boudreaux 2011

3. RESULTS AND DISCUSSION

3.1 Characteristics and Performance of Coffee Agriculture in Rwanda Economy

3.1.1 General characteristics of Rwanda's economy

Rwanda's economic recoveries since the 1994 genocide and civil war have been impressive. With the support of the World Bank and the International Monetary Fund, Rwanda has been able to sustain its economic growth making economic and structural reforms that have enable the country to be a Middle Income Country by 2035 and High-Income Country by 2050 [16,17].

Rwanda enacted two, five-year Economic Development and Poverty Reduction Strategies, EDPRS (2008–12) and EDPRS-2 (2013–18)that resulted in immense economic and social development.

During that period, Rwanda's Real GDP in national currency (Constant Prices National Currency) rose from RWF4,919 in 2010 to RWF9,145 in 2019 at an average Year-on-Year (YoY) growth of 7%. Nominal GDP in national currency (Current Prices National Currency) rose from RWF3,569 in 2010 to RWF9,315 in 2019. The average YoY growth during that period was 11% with a highest growth rate of 16% between 2010/2011. The average YoY growth rate for Nominal GDP (US$) was 6% as Nominal GDP (US$) rose from US$6,121 billion in 2010 to US$10.356 billion in 2019.

Rwanda's aspirations to be a Middle Income Country by 2030 highlight the prioritisation of social growth and promoting domestic savings. A series of seven-year National Strategies for Transformation (NST1) focusing on meeting the development goals of the UN are considered vital to attaining per capita growth [18-21].

Real GDP Per Capita RWF rose at an average of 5% between 2010 and 2019. The average growth for Nominal GDP Per Capita RWF was almost double at 9% during the same period. Nominal GDP Per Capita US$ grew at an average of 6% rising from US$1,355 in 2010 to US$2,364 in 2019.

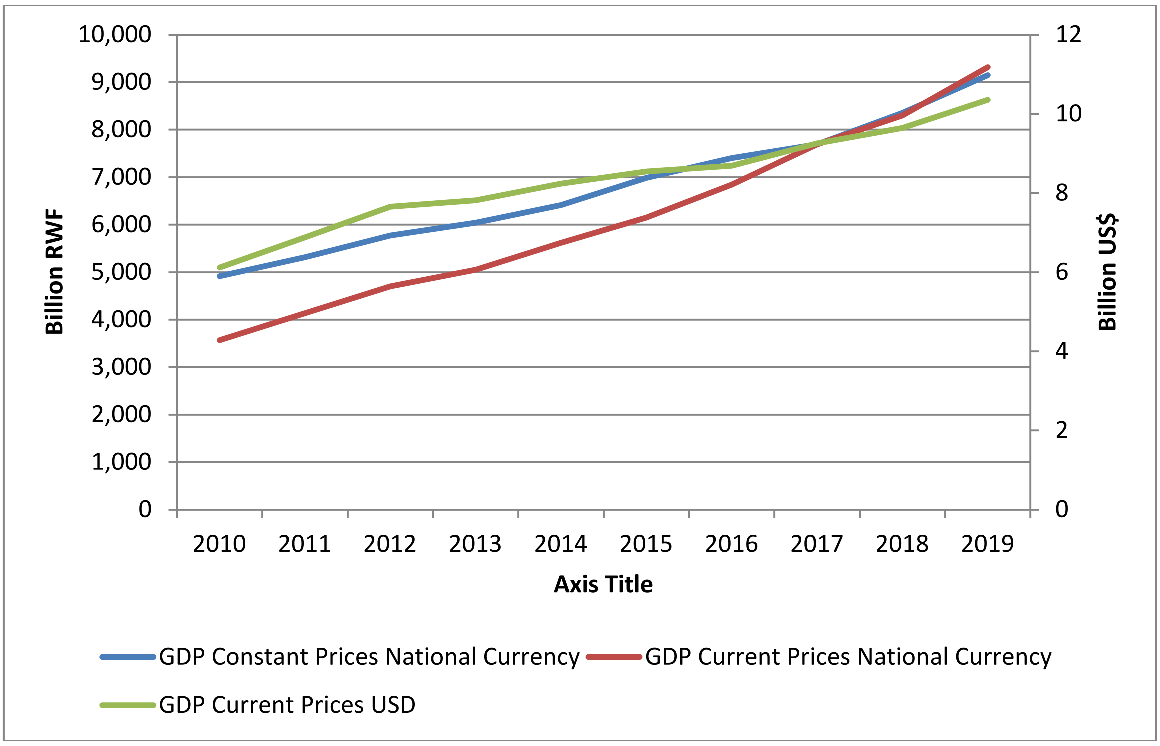

Fig. 3. Rwanda GDP

Source: IMF, world economic outlook database, October 2021

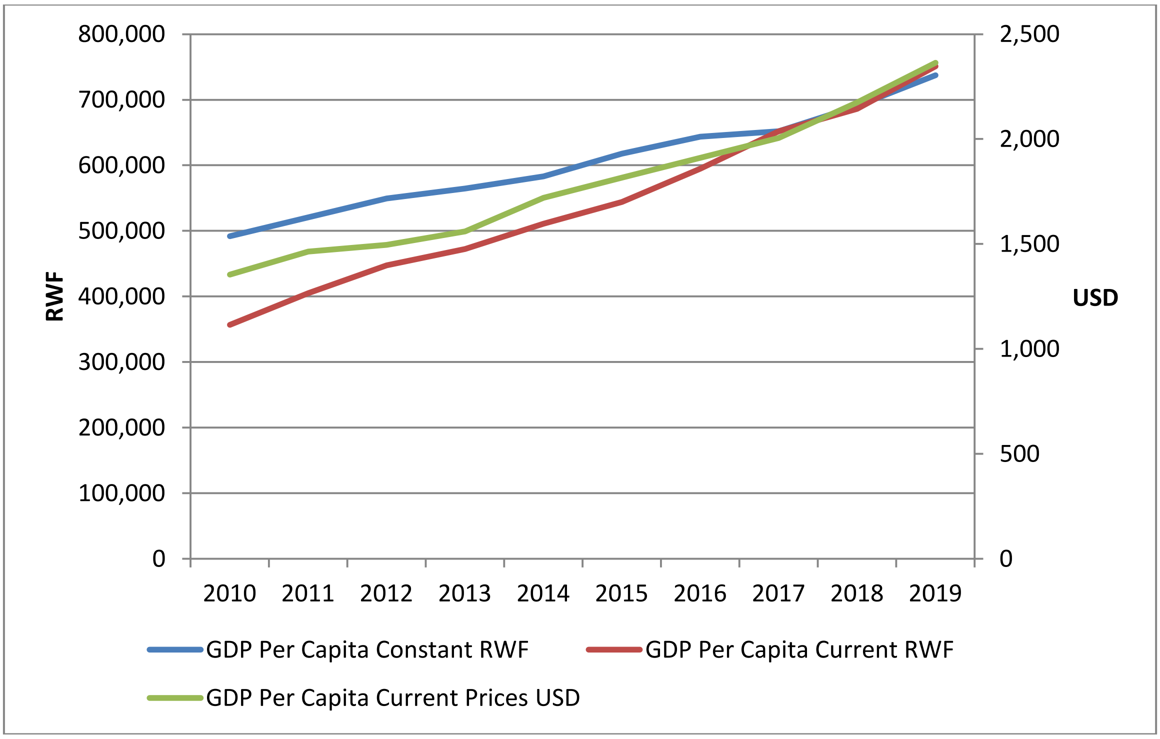

Fig. 4. Rwanda GDP per capita

Source: IMF, world economic outlook database, October 2021

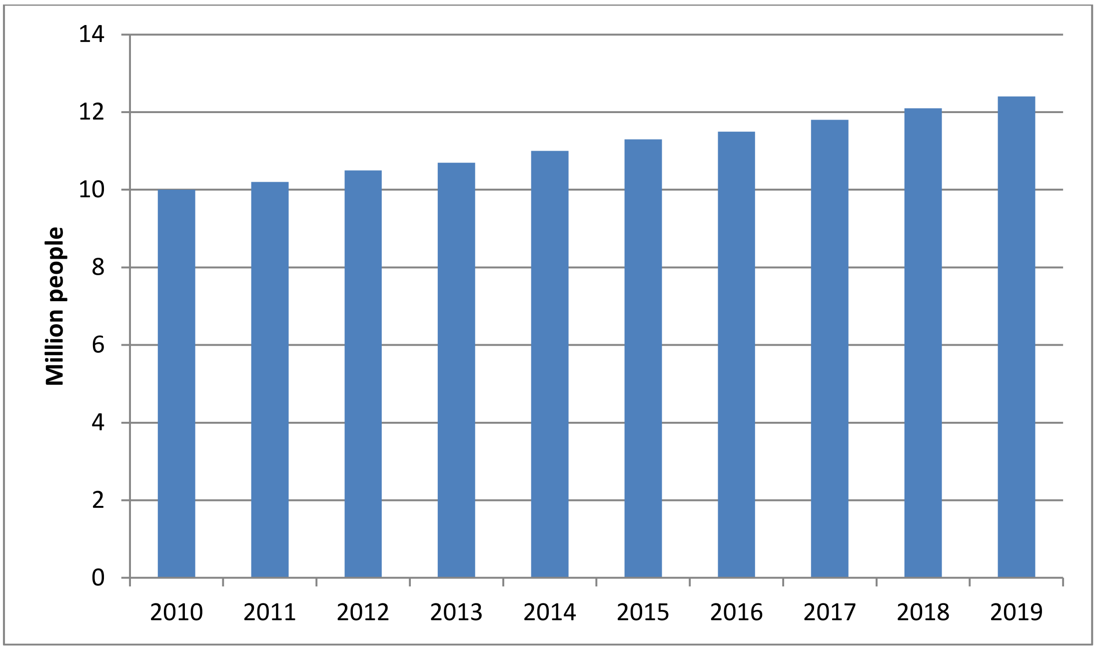

Fig. 5. Rwanda population
Source: IMF, world economic outlook database, October 2021

The population of Rwanda was 10 million people in 2010. It rose by 2.4 million people to record 12.4 million in 2019. The average YoY growth rate during that period was 2%.

Rwanda's rural population increased from 8.34 million in 2010 to 10.44 million in 2019. During this period the economic YoY growth rate averaged 3%. The urban population grew at a slightly higher growth rate at 3% during the same period. Over the 10 years rural population averaged 83% of the total population.

Rwanda has a very youthful population with over 56% of the population in the 15-64 age range. The 0-14 age range constitutes 41% of Rwanda's population. The 65+ age makes up just 3% of Rwanda's population.

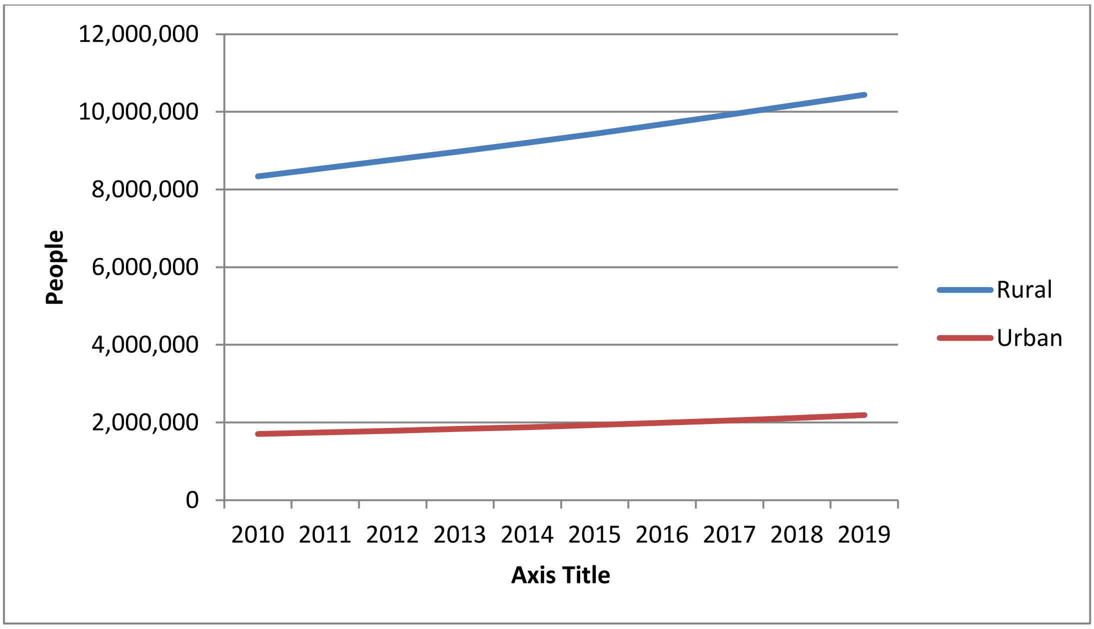

Fig. 6. Rwanda population distribution
Source: IMF, world economic outlook database, October 2021

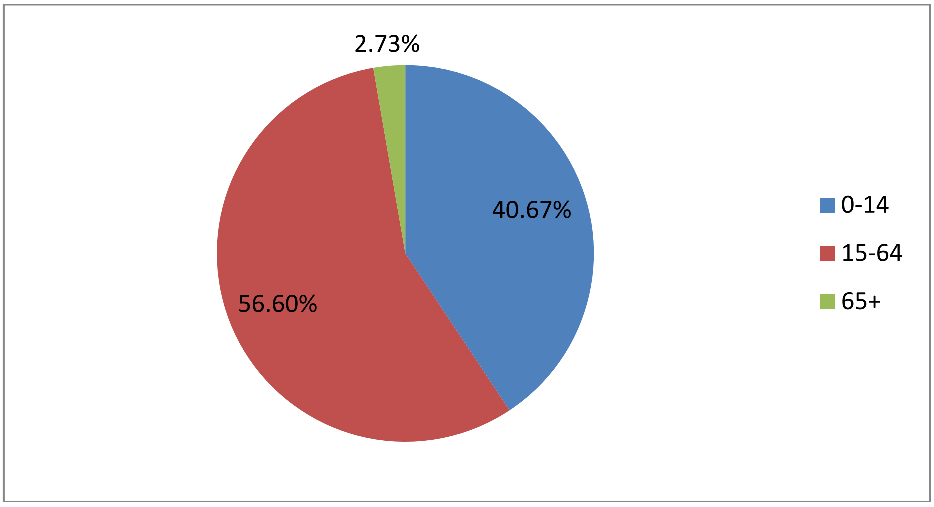

Fig. 7. Rwanda population age distribution
Source: IMF, world economic outlook database, October 2021

Job creation is one of the key components responsible for Rwanda's economic growth. To sustain this growth Rwanda's NST1 aims to create a further 1.5 million jobs by 2024. High priority sectors with job creation potential were identified for partnership with government, private sector and other stakeholders. These sectors include agro-processing, Horticulture, Manufacturing, value addition off minerals, construction, tourism and transport as well knowledge-based services and creative art (National Institute of Statistics of Rwanda, 2019).

Rwanda's labour force grew at an average YoY growth rate of 3% per year rising from 4.94 million in 2010 to 6.35 million in 2019. Over the 10 years 52% of the labour force was made up of women while men were 48%.

Rwanda's sustained economic growth resulted to an estimated one million people being lifted out of poverty between 2000 and 2017. During that period the revenue from collected taxes increased 20 fold, the national budget increased 14 times and life expectancy rose from 29 to 67 years.

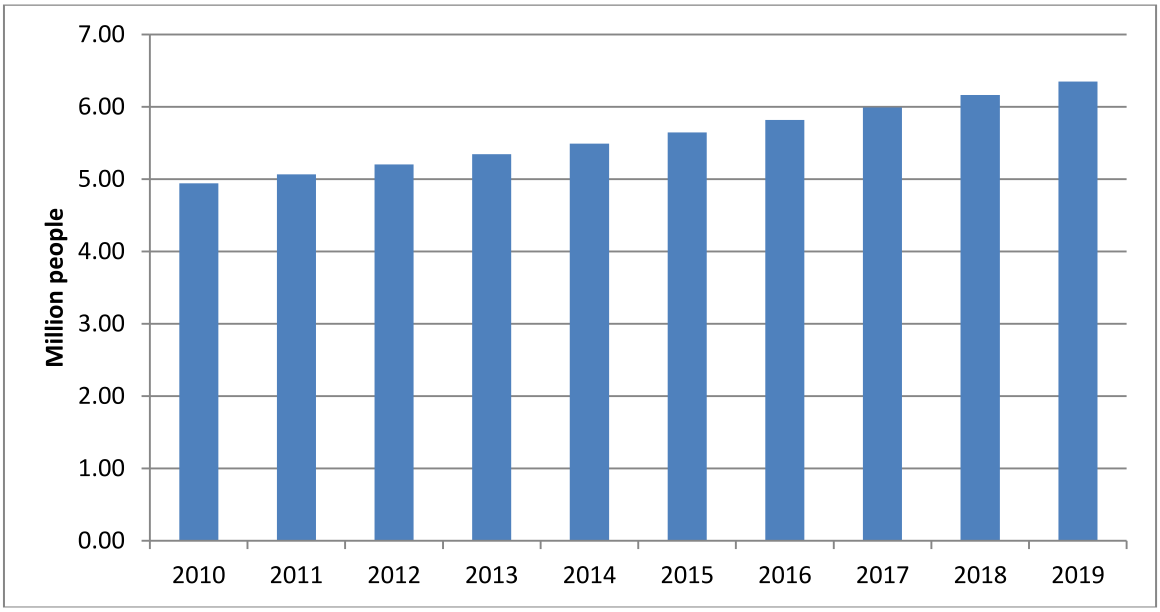

Fig. 8. Rwanda employment
Source: IMF, World Economic Outlook Database, October 2021

Rwanda's economy grew by 12% between 2010/2011 before declining between 2013 and 2019.

The Consumer Price Index (CPI) rose from 84.6 in 2010 to 122.7 in 2019. Inflation was highest between 2010/2011 as the CPI rose from 84.6 to 91.6 an increase of 8%. Inflation was lowest at 1% between 2016/2017 when CPI increased from 113 to 113.71 an increase of only 0.71 points. The average inflation for the period under study was 4%.

3.2 Contribution of Agriculture in the Economy

Agriculture is a historical mainstay of Rwanda's economy contributing immensely to economic growth, poverty reduction and providing 90% of the country' food needs [5]. Agriculture exports including coffee, tea, hides and skins, pyrethrum, and horticulture account for a significant portion of the country's foreign exchange earnings. Rwanda's high altitudes, fertile soils and moderate temperature allow for all year round cultivation (Rwanda Development Board, n.d.).

Rwanda has a total land 2,467,000 hectares. Agriculture land use is 74% or 1,815,000 hectares. Most of the agricultural land is dedicated to dry beans, maize, cassava and sweet potato production.

Agriculture's percentage of total employment has been declining at an average of -3% between 2010 and 2019. In 2010 79% of the total employment was employed in agriculture. This reduced significantly to 62% of total employment in 2019.

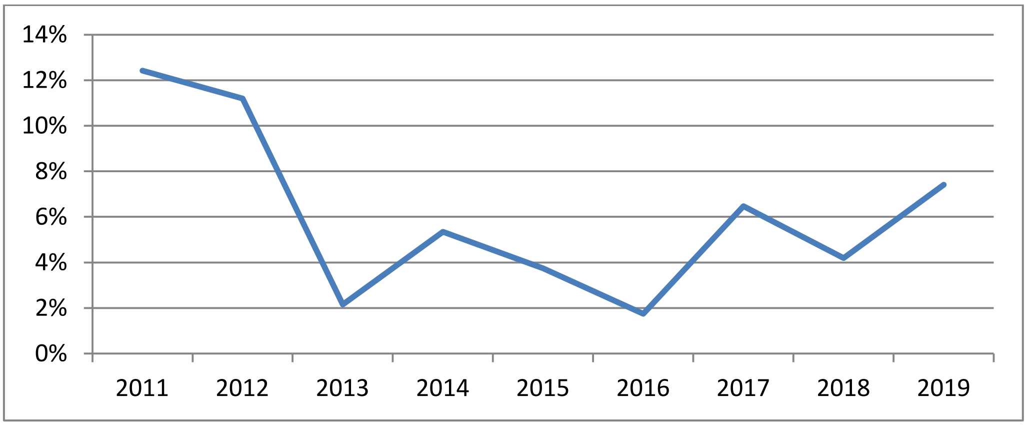

Fig. 9. Rwanda economic growth rate

Source: IMF, World Economic Outlook Database, October 2021

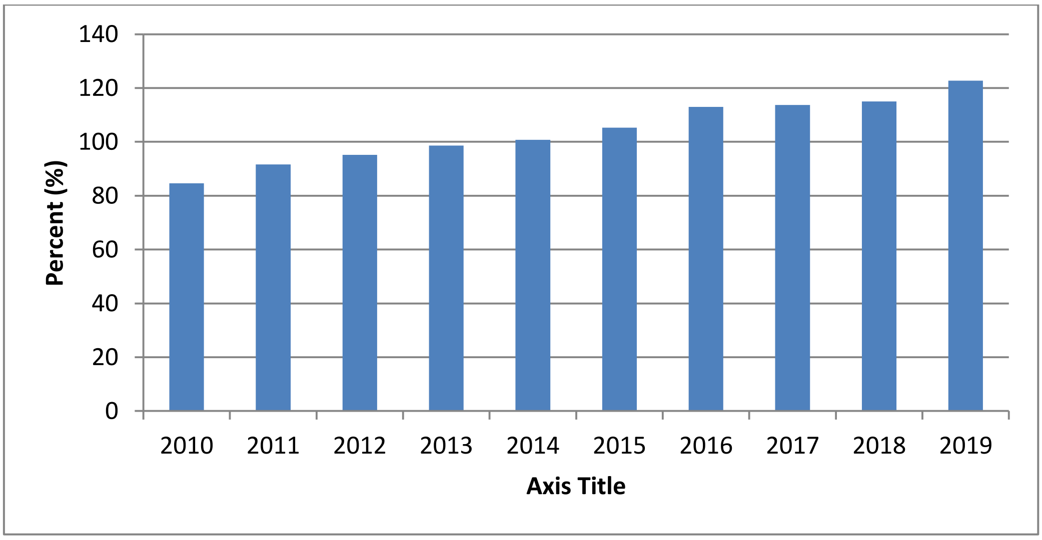

Fig. 10. Rwanda inflation

Source: IMF, world economic outlook database, October 2021

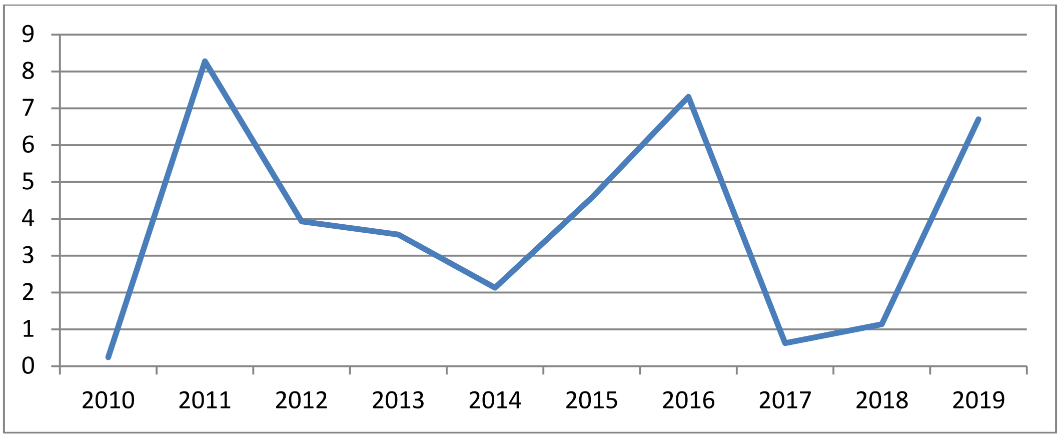

Fig. 11. Rwanda inflation percentage change

Source: International Monetary Fund, World Economic Outlook Database, October 2021

Table 1. Rwanda land use by crop

Crop	2015	2016	2017	2018	2019
Beans, dry	503,546	513,137	549,441	557,209	582,670
Maize (corn)	241,713	237,658	297,447	296,330	288,298
Cassava, fresh	82,915	91,887	120,000	194,717	195,135
Sweet potatoes	139,706	135,575	184,609	173,122	183,889
Sorghum	137,696	165,812	143,490	144,137	161,850
Bananas	403,274	403,275	237,849	142,244	157,256
Potatoes	78,214	106,236	93,991	119,220	107,590
Plantains and cooking bananas	228,432	229,490	96,571	90,175	86,707
Pumpkins, squash and gourds	48,875	49,519	50,154	50,585	50,440
Soya beans	46,010	46,446	53,361	54,793	46,695
Groundnuts, excluding shelled	26,712	26,065	45,512	41,457	43,920
Rice	30,204	33,430	31,583	32,780	32,896
Peas, dry	31,853	26,147	19,809	25,962	24,772
Coffee, green	35,500	29,964	29,558	23,412	21,793
Tea leaves	17,188	17,221	18,509	20,466	20,851
Leeks and other alliaceous vegetables	15,069	14,479	14,560	14,702	14,580
Wheat	4,419	5,817	10,758	12,225	13,234
Other fruits, n.e.c.	11,212	11,290	11,330	11,203	11,196
Tomatoes	9,081	10,439	11,329	7,773	10,731

Source: FAOSTAT (www.fao.org/faostat)

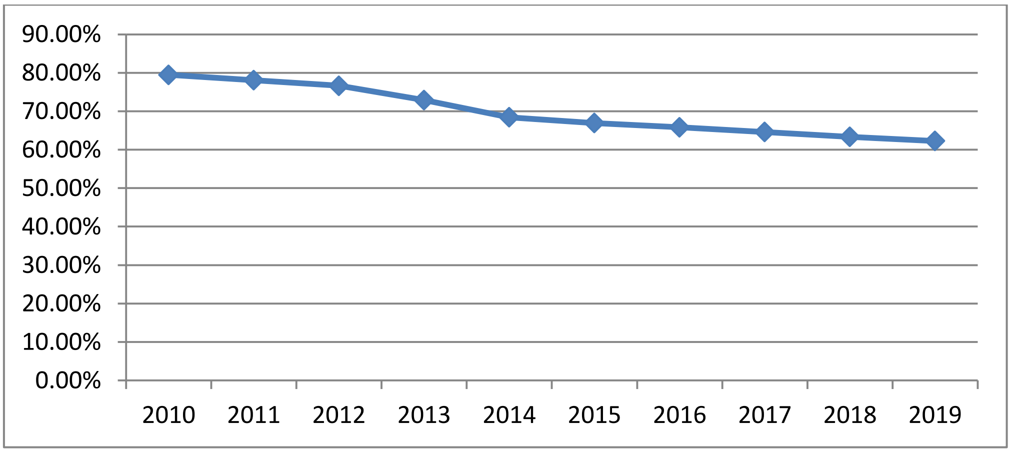

Fig. 12. Agriculture percentage of total employment

Source: FAOSTAT (www.fao.org/faostat)

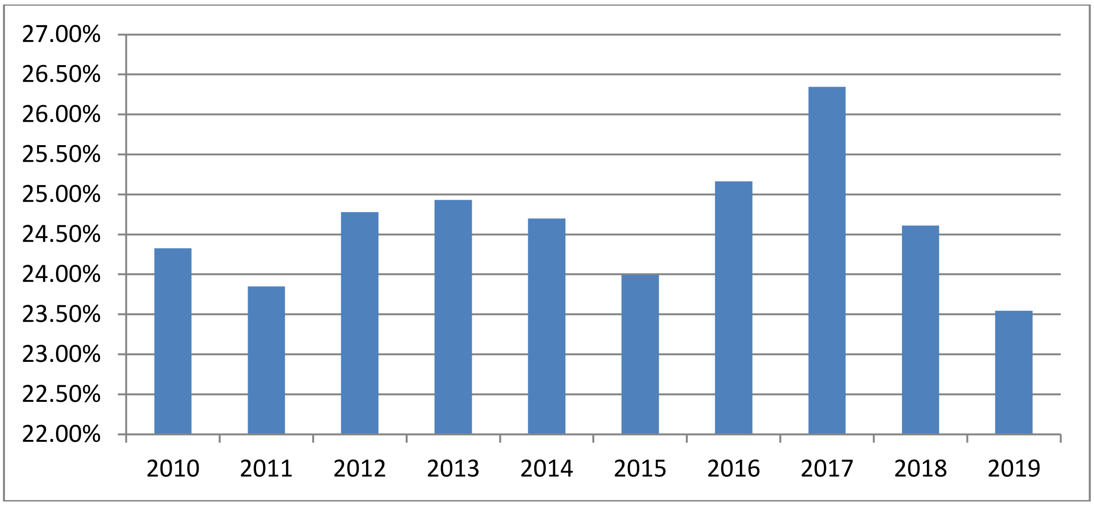

Fig. 13. Agriculture percentage of GDP

Source: IMF, World Economic Outlook Database, October 2021

Agriculture contributed an average of 5% to the GDP of Rwanda during the year under study. The highest contribution to the GDP was recorded in 2017 at 26%.

3.4 Coffee area Harvested, Yield and Quantity

Global Area Harvested for coffee rose from 10.51 million hectares to 11.06 million hectares at an average of 1%. Negative growth was experienced between 2010/2011 (from 10.52 million hectares to 9.93 million hectares), 2013/2014 (from 10.49 million hectares to 10.38 million hectares), 2015/2016 (from 10.77 million hectares to 10.76 million hectares) and 2016/2017 (from 10.76 million hectares to 10.32 million hectares). The top 10 countries with the highest area harvested also experienced negative growth during the same period. The top 10 countries had an area harvested of 7.42 million hectares in 2010 rising to 8.13 million hectares in 2019 at an average of 1% contributing an average of 74% of global area harvested during the period of 2010-2019.

Globally Rwanda is considered a small producer with growing potential. The Rwandan government has invested a lot in the growth of the sector and has received international support to develop the sector. However, there are still a number of challenges that hampers coffee productivity in Rwanda including pests and diseases like coffee leaf rust and coffee berry disease and poor transport infrastructure.

Coffee area harvested in Rwanda grew sharply between 2010 and 2014 at an average growth rate of 13% as the sector experienced growth due to the construction of new wash stations, improved price and increased involvement of international organisations. This period of growth ended with a sharp decline of 35% between 2014/2015. The decline continued to 2019 at an average of 11%. Overall, the area harvested declined from 33,977 hectares in 2010 to 21,793 hectares in 2019 at an average growth rate of -3%.

Perennially low coffee prices estimated at about 24% of prices in other regions resulting in lower profits and even losses for Rwandan farmers have left many farmers discouraged and stopping them from investing in their plantations (Clay, D & Bizoza A, 2018). Consequentially many farmers were driven to abandoning their coffee trees and to uproot them in favour of other, more profitable crops (Clay, D & Bizoza A, 2018). This contributed to the sharp decline in the area harvested.

Global yield rate averaged 0.87 tonnes per hectare between 2010 and 2019. Only Africa's average yield rate (0.44 tonnes per hectare) was below this figure in the same period. Asia had the highest average yield rate managing an average of 1.07 tonnes per hectare between 2010 and 2019.Oceania had the second highest average yield rate of 1.06 tonnes per hectare between 2010 and 2019. The America's average yield rate was 0.97 tonnes per hectare.

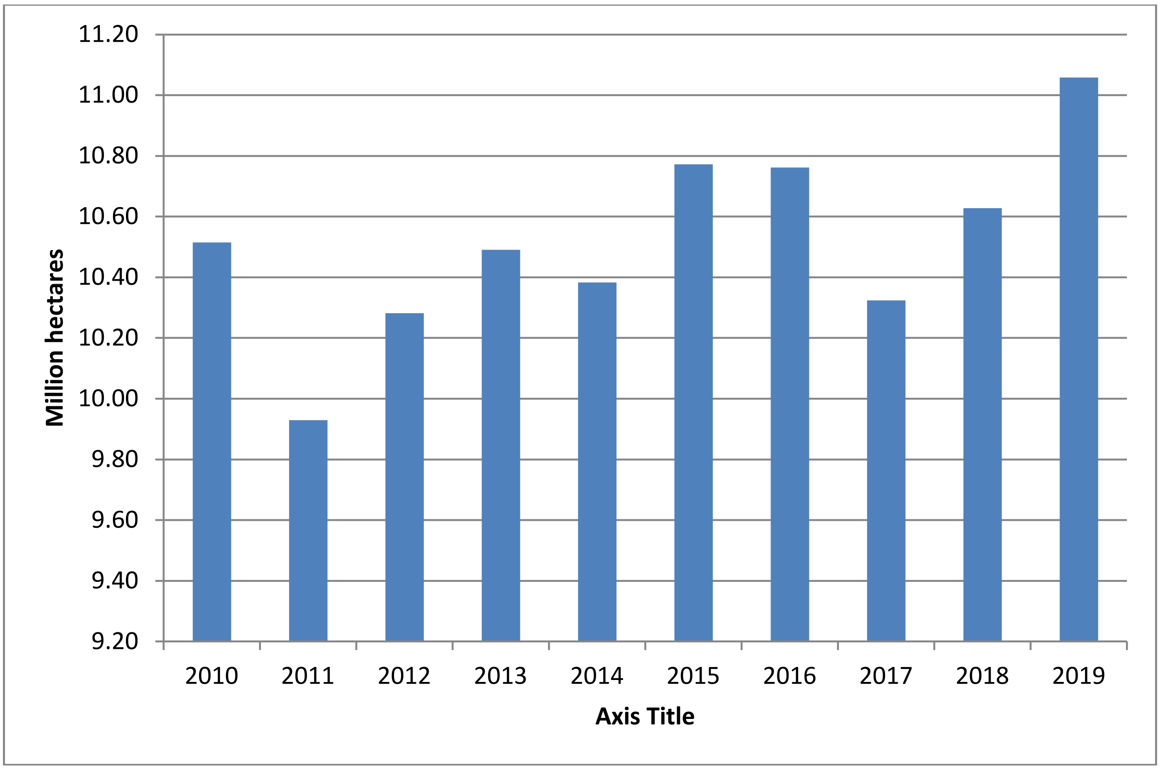

Fig. 14. World coffee area harvested
Source: FAOSTAT (www.fao.org/faostat)

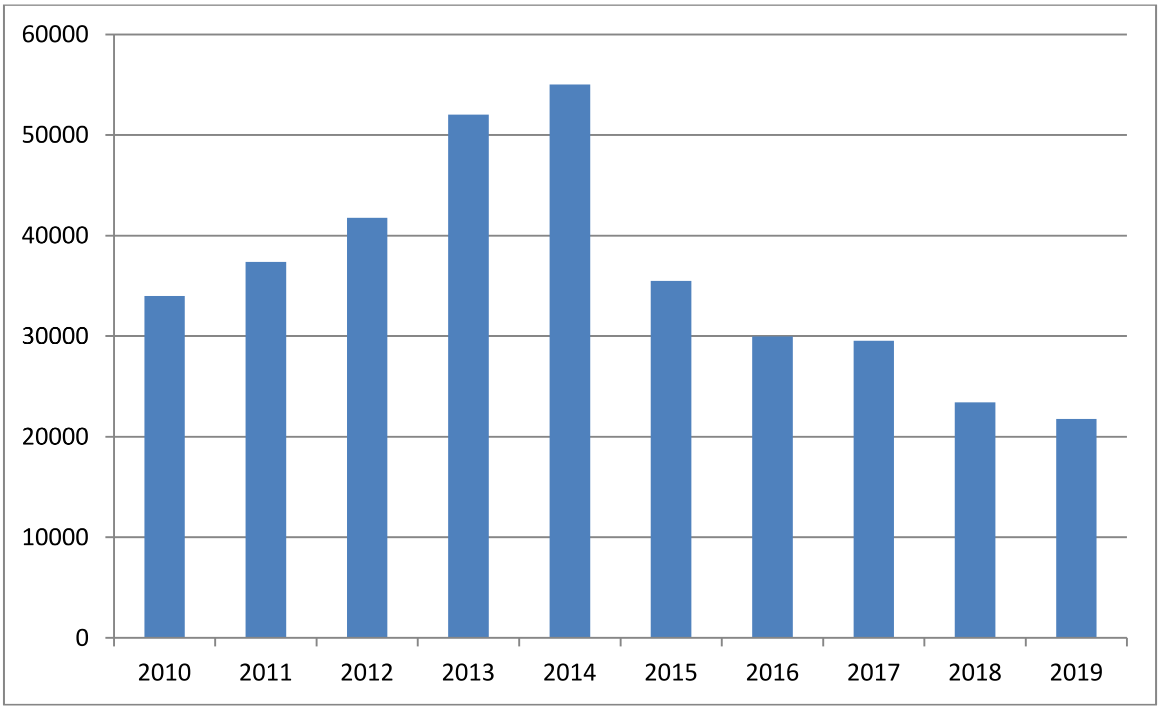

Fig. 15. Rwanda coffee area harvested
Source: FAOSTAT (www.fao.org/faostat)

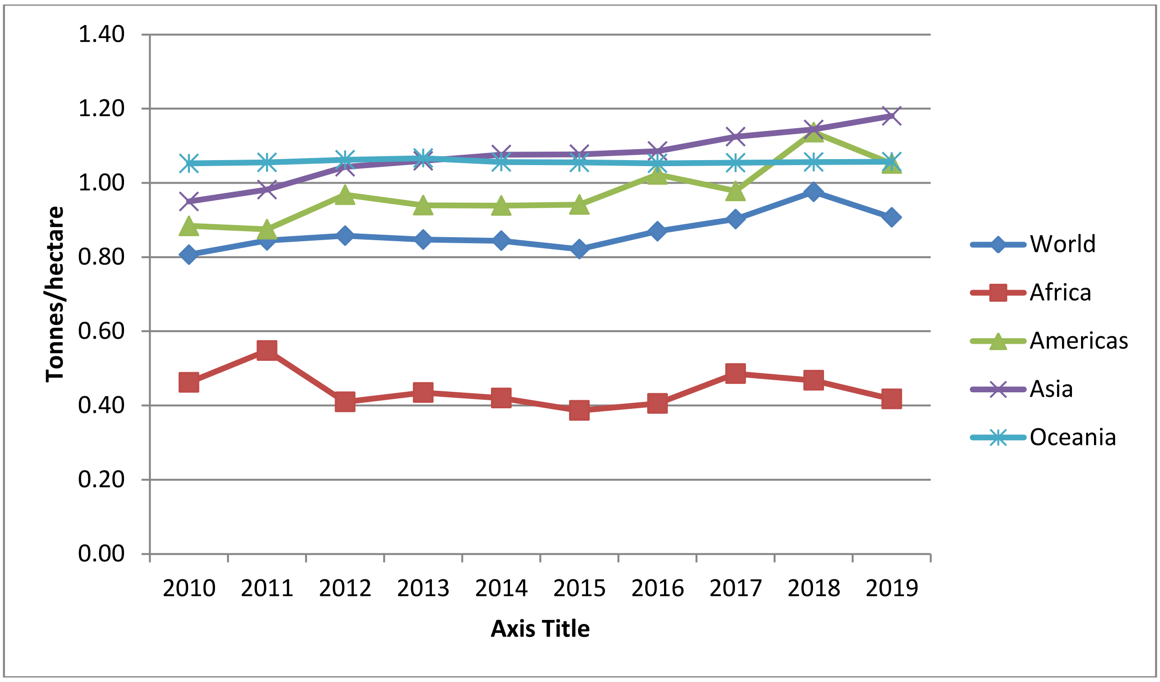

Fig. 16. Regional coffee yield rate
Source: FAOSTAT (www.fao.org/faostat)

Table 2. Coffee yield rate global top 20 producers

Country	2015	2016	2017	2018	2019
	Tonnes per hectare				
China, mainland	2.75	2.85	2.97	2.98	3.07
Viet Nam	2.45	2.44	2.55	2.61	2.70
Malaysia	3.00	3.53	3.91	2.28	2.26
Malawi	1.68	1.68	1.88	2.33	2.16
Lao People's Democratic Republic	1.75	1.75	1.86	1.86	1.99
Sierra Leone	0.23	2.04	2.00	1.91	1.84
Brazil	1.34	1.51	1.49	1.91	1.65
Ghana	1.60	1.60	1.60	1.60	1.60
Tonga	1.45	1.50	1.60	1.60	1.50
Rwanda	0.61	0.82	1.07	1.65	1.35
Nigeria	1.30	1.29	1.31	1.30	1.30
Paraguay	1.32	1.32	1.38	1.38	1.29
Belize	1.20	1.29	1.24	1.24	1.23
Honduras	1.23	1.18	1.09	1.11	1.12
Nicaragua	0.83	1.02	0.96	1.06	1.06
Papua New Guinea	1.06	1.06	1.06	1.06	1.06
Colombia	1.03	1.05	0.94	0.99	1.04
Costa Rica	1.00	1.11	0.97	0.93	1.00
Bolivia (Plurinational State of Bolivia)	0.91	0.92	0.90	0.90	0.97
Burundi	0.92	0.94	0.99	0.96	0.91

Source: FAOSTAT (www.fao.org/faostat)

China had the highest yield rate in 2019 with 3.07 tonnes per hectare. Vietnam (2.7 tonnes per hectare), Malaysia (2.26 tonnes per hectare), Malawi (2.16 tonnes per hectare) and Lao People's Democratic Republic (1.99 tonnes per hectare) made up the top five with China. Rwanda's average yield rate of 1.35 tonnes per hectare was rated tenth in 2019 and was higher than the world average of 0.91 tonnes per hectare in the same year. There were five countries from Africa in the top 10, four from Asia and one from the Americas.

Rwanda's yield rate reached its highest of 1.65 tonnes per hectare in 2016. The lowest was 0.3 tonnes per hectare in 2014. The average yield rate between 2010 and 2019 was 0.78 tonnes per hectare. However, since 2017 the average yield rate was 1.36 tonnes per hectare. Following the declining yield rates, Rwanda's National Agricultural Export Board (NAEB) initiated interventions aimed at improving yield rates and productivity. A memorandum of understanding was signed between NAEB and coffee washing stations to allocate farmers fertilisers to improve soil fertility. Facilitators were also recruited to assist farmers in good agricultural practises. At the same time, a program called Effective Microorganism Technologies was introduced to convert coffee pulp, a waste material of coffee production, into organic fertiliser. Pests and disease management programs were also initiated which included the distribution of pesticides for common pests and diseases. Organizations like Techno servewere also engaged to teach farmers climate-smart agricultural techniques, including mulching, composting, shade management, and rejuvenating old coffee trees. These measures contributed significantly to the improvement in the yield rate.

World production quantity was highest in 2019 at 10,368 million tonnes. The average growth rate was 2% between 2010 and 2019. The highest growth rate was between 2017/2018 at 11%.

Brazil produced 3,012 million tonnes in 2019 and was the highest producer that year. Vietnam was the only other country to produce more than a million tonnes in 2019. However its production total of 1.687 million tonnes was almost half of Brazil's total. Colombia, Indonesia and Ethiopia produced 885 120, 741 657 and 482 561 tonnes respectively in 2019.

Africa produced 1.09 million tonnes of coffee in 2010. Production quantity fell by 9% between 2010/2011 to 987,479 tonnes in 2011 and by a further 1% to 975,108 tonnes in 2012. Production in Africa is characterised by periods of positive growth followed by negative growth (cyclic production). The average growth rate between 2010 and 2019 was 2%. In 2019 1.28 million tonnes of coffee were produced.

Ethiopia produced 38% (482,561 tonnes) of Africa's production quantity and was the top producer in Africa. Uganda was the second highest producer producing 24% (312,601 tonnes) which was 2% more than the rest of Africa (23%). Tanzania, Madagascar and Côte d'Ivoire produced 5%, 5% and 57% of Africa's production quantity respectively.

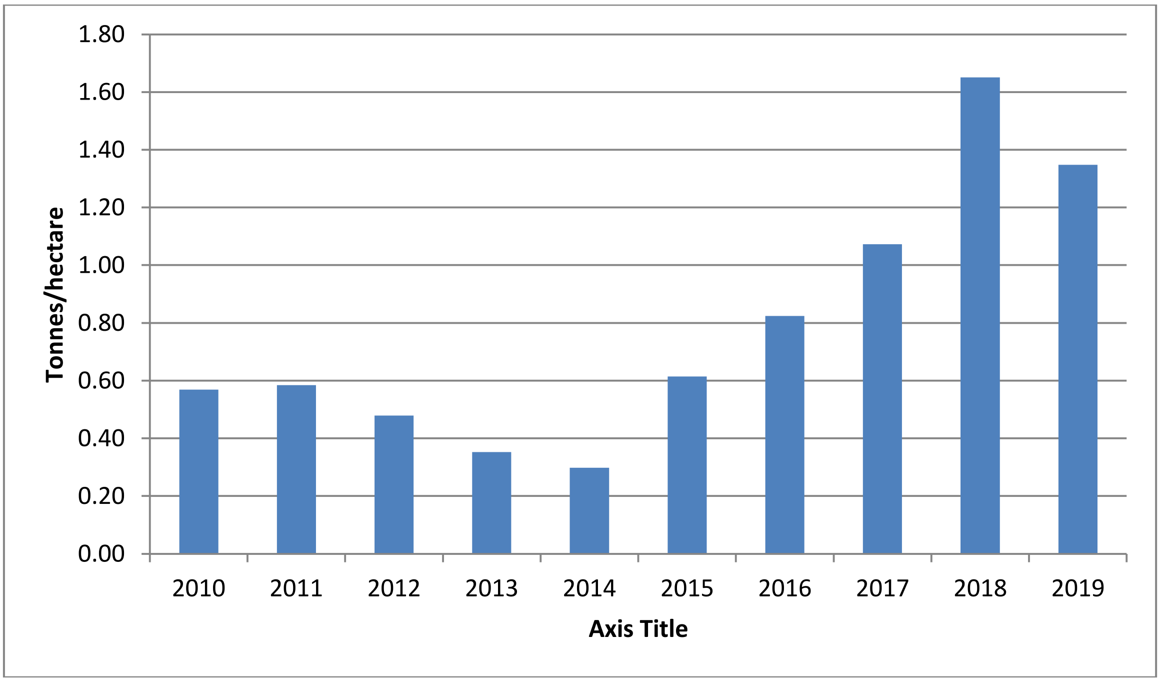

Fig. 17. Rwanda coffee yield rate
Source FAOSTAT (www.fao.org/faostat)

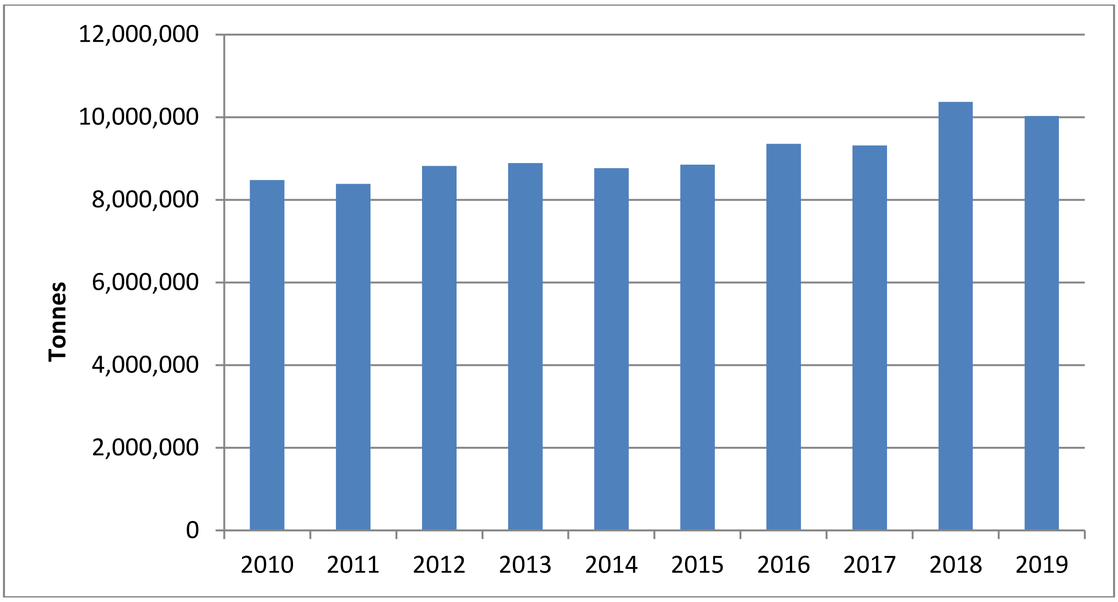

Fig. 18. World coffee production quantity
Source: FAOSTAT (www.fao.org/faostat)

Table 3. Coffee production in the world top 20 producing countries

Country	2015	2016	2017	2018	2019
	Production in tonnes				
Brazil	827,750	3,024,466	2,684,508	3,552,729	3,011,745
Viet Nam	639,412	1,460,800	1,542,398	1,616,307	1,686,765
Colombia	457,014	818,243	851,640	813,420	885,120
Indonesia	332,747	639,305	717,962	756,051	741,657
Ethiopia	327,000	469,091	449,230	494,574	482,561
Honduras	251,938	366,542	477,580	478,831	472,497
India	229,149	348,000	312,000	316,000	319,500
Peru	225,653	277,760	337,330	369,622	363,320
Uganda	188,934	243,061	302,063	284,225	312,601
Guatemala	135,925	236,145	224,000	240,400	216,400
Mexico	127,000	151,714	153,777	158,308	165,712
Lao People's Democratic Republic	115,140	136,600	150,795	154,435	171,380
Côte d'Ivoire	95,255	106,000	33,600	41,434	65,036
China, mainland	83,846	113,345	114,074	115,500	120,000
Nicaragua	72,342	122,470	128,111	141,931	156,902
Costa Rica	57,982	93,720	90,419	66,611	66,301
Philippines	49,987	68,823	62,078	60,313	60,044
Papua New Guinea	47,507	53,719	46,980	53,160	43,980
Venezuela (Bolivarian Republic of Venezuela)	42,674	50,948	56,630	56,525	57,015
Madagascar	42,000	53,093	59,602	55,542	65,760
United Republic of Tanzania	35,938	60,921	47,693	45,254	68,147
Kenya	35,682	46,100	38,620	41,375	44,500
Cameroon	32,230	35,600	36,540	36,026	36,055
El Salvador	30,999	38,636	41,141	45,660	39,660
Guinea	26,089	38,900	40,800	50,000	56,670

Source FAOSTAT

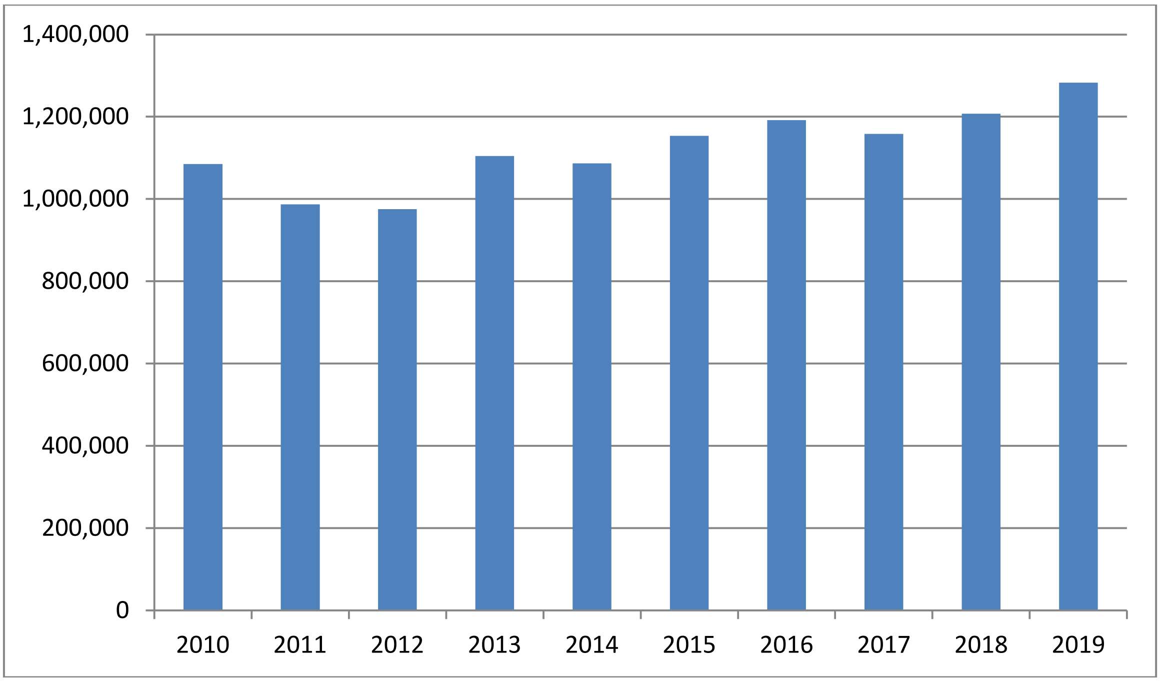

Fig. 19. Africa coffee production quantity
Source FAOSTAT (www.fao.org/faostat)

Table 4. Africa top coffee producers

Country	2015	2016	2017	2018	2019
	Tonnes				
Ethiopia	457,014	469,091	449,230	494,574	482,561
Uganda	229,149	243,061	302,063	284,225	312,601
Côte d'Ivoire	127,000	106,000	33,600	41,434	65,036
Madagascar	47,507	53,093	59,602	55,542	65,760
United Republic of Tanzania	42,674	60,921	47,693	45,254	68,147
Kenya	42,000	46,100	38,620	41,375	44,500
Cameroon	35,938	35,600	36,540	36,026	36,055
Guinea	32,230	38,900	40,800	50,000	56,670
Democratic Republic of the Congo	30,999	29,644	29,626	30,090	29,787
Rwanda	21,808	24,689	31,718	38,643	29,366
Burundi	18,367	13,624	16,340	14,216	14,059
Togo	16,093	17,933	18,476	19,076	21,316
Angola	15,000	14,680	14,896	14,859	14,811
Central African Republic	9,050	10,120	9,299	9,374	10,118
Malawi	7,217	7,217	8,420	11,082	11,000
Zambia	6,517	6,609	6,509	6,545	6,555
Equatorial Guinea	4,254	4,174	4,205	4,226	4,207
Congo	3,039	3,062	3,035	3,045	3,048
Sierra Leone	2,756	2,275	2,277	2,685	2,399
Nigeria	1,755	1,942	1,897	1,864	1,901

Source: FAOSTAT (www.fao.org/faostat)

Rwanda's coffee production has reached a very critical stage owing to the challenges that affect productivity – low profits, poor transport infrastructure, mismanagement of washing stations, lack of access to inputs, adverse weather etc. Another challenge that has become apparent and resulted in the decrease in coffee production is the age of coffee farmers (Woodsie, B. 2020). The average age African farmers is 60 years old despite the majority of the continent's population being 24 years and under. Furthermore, coffee is mainly produced in the rural areas which are currently losing the younger generation due to increased rural to urban migration. Without the help of the youth, the ageing farmers find it difficult to sustain high productivity [21-26].

To address these challenges and increase the productivity of coffee farmers, the NAEB commenced initiatives to improve the yield of coffee plants. The subsequent increase in yields contributed to the rise in production quantity from the lowest level of 16,379 tonnes in 2014 to 21,808 in 2015 and 29,366 in 2019. Furthermore, NAEBstarted capacity building of farmers through Farmer Field Schools (FFS) to educate farmers on good farming practices and other issues to improve their understanding of the coffee value chain [27].

Rwanda international support was also integral as various organisations also sort to improve farmer capacity and productivity. For example, Challenges Worldwide launched a five year Coffee Market Building for Peace and Prosperity project in 2017 to improve farmers' business models and help them generate capital and enhance sustainability. The project also addressed the impacts of climate change and helps farmers reduce operating costs by using renewable energy [28]. Such interventions have resulted in the sustaining of the upward trend of coffee production in Rwanda.

3.5 Position of Rwanda in the International Coffeetrade

Global coffee exports grew from 6.58 million tonnes in 2010 to 7.95 million tonnes in 2019 at an average growth rate of 2% over the decade. Quantity exported in 2019 was the highest in the period understudy and was a 7% growth from the previous year total of 7.49 million tonnes. The cyclical YoY growth rate of coffee exports highlighted the factors affecting production of coffee in particular the alternate bearing cycles of production.

The value of exported coffee rose by 51.4% between 2010/2011. In 2012, an economic crisis in Europe grossly affected coffee prices causing the value of coffee to decline [28,29]. As a result the compound annual growth rate of the value of coffee exported between 2010 and 2019 was only 0.20%. The average export value of a tonne of coffee was $2,899 during the period under study. The highest export value per tonne was $4,034 in 2011 and the lowest was $2,301 in 2019.

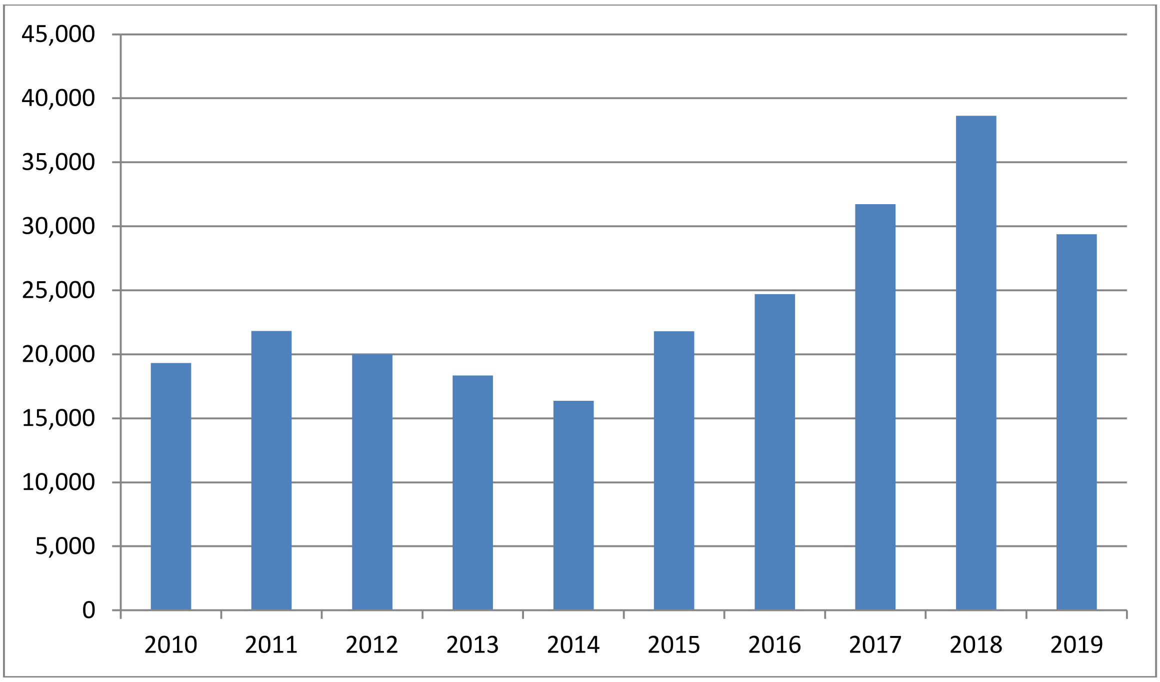

Fig. 20. Rwanda coffee production
Source: FAOSTAT (www.fao.org/faostat)

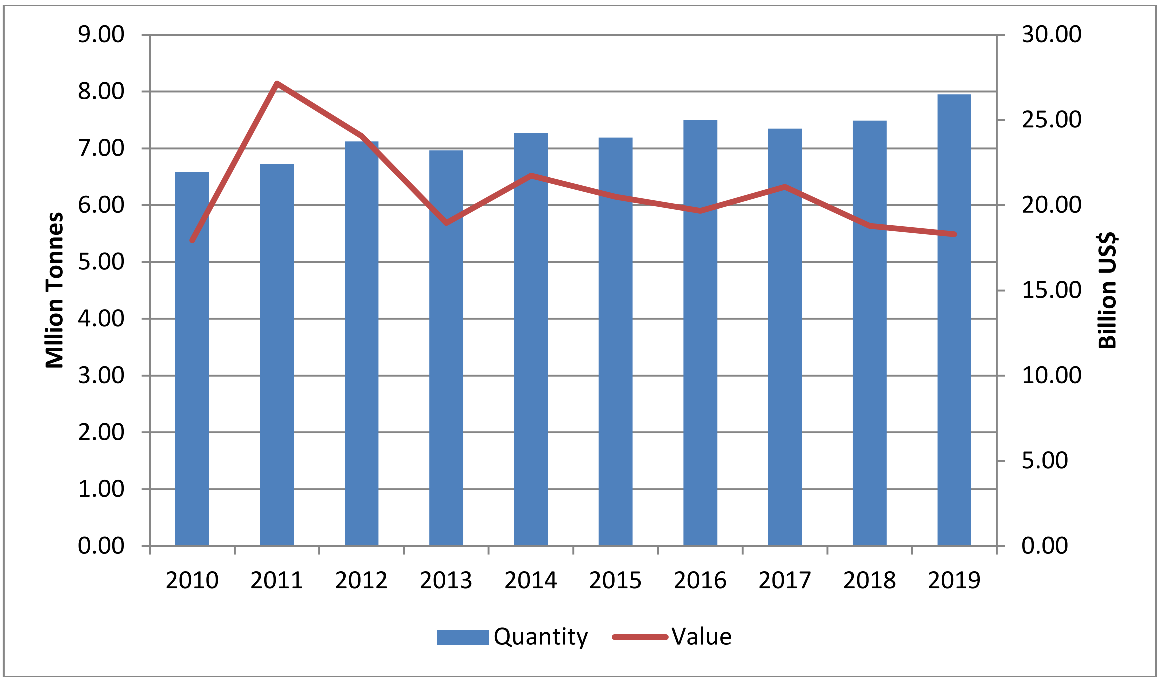

Fig. 21. World coffee export quantity and value
Source: FAOSTAT (www.fao.org/faostat)

Table 5. Top coffee exporters

Country	2015	2016	2017	2018	2019
	Export in Tonnes				
Brazil	2005034	1823886	1647811	1827000	2230872
Viet Nam	1280202	1700998	1459345	1613486	1409810
Colombia	713060	734689	712542	712696	753366
Indonesia	499651	412529	448955	277475	326050
Germany	310834	335643	348495	361666	356233
Honduras	285228	309924	430743	429741	411806
Ethiopia	234218	159712	194175	111254	238372
Uganda	219336	210584	286998	252166	276836
India	209419	250415	262770	229986	232664
Belgium	189803	188781	211168	216219	231946
Guatemala	183350	182588	203435	205925	214907
Peru	175201	239343	245735	261256	232039
Nicaragua	103757	117657	127565	136506	170301
Mexico	91998	79916	112988	113354	97986
Costa Rica	68579	75495	69086	75246	63068
Côte d'Ivoire	65218	73409	39952	76796	108579
China, mainland	61639	82666	60555	90078	66966
Tanzania	57820	57925	41363	56347	67648
Kenya	42900	46817	43470	44597	48726
Papua New Guinea	41849	54825	55356	50298	50708
United States of America	36829	40628	34577	32525	27318
El Salvador	34897	29308	32571	35150	35840
Cameroon	28246	32858	28508	16650	19511
Spain	25538	31036	31206	24721	28444
Timor-Leste	23800	23069	4833	7657	5736
Rwanda	18263	17523	18671	22042	23921

Source: FAOSTAT (www.fao.org/faostat)

Brazil exported 2.23 million tonnes of coffee, the most coffee exported by a single country in 2019. Brazil, Vietnam and Colombia were the only countries in the top 5 of global producers to be in the top 5 of global exporters of coffee. Vietnam and Colombia exported 1.41 million tonnes and 753,366 tonnes respectively. Germany was the fifth exporting country in 2019, exporting 356,233 tonne despite not being a major producer owing to their re-exporting of coffee from Rwanda and Uganda. Ethiopia and Uganda, the only African countries in the top ten of global exporters in 2019 exported 238,372 and 276836 tonnes respectively.

The top 10 coffee exporting countries exported an average of 81.52% of global coffee exports between 2010 and 2019. In 2019 the top ten exporters exported 81.37% of global exports slightly below the 10 year average. This was the first time since 2014 that the top 10 exported below the average.

Africa's export quantity was 832,282 tonnes in 2019, the highest for the period under study. The average growth rate was 3 % between 2010 and 2019. The growth rate was marked by fluctuations with positives as high as 32% and negatives as low as -16%.

The value of coffee exports was US$1.87 billion in 2019 an increase of 12% from the 2010 value of US$1.67 billion. However, the average YoY growth rate from 2010 to 2019 was 3%. CAGR for the period under study was 1.12%.

The average export value per tonne between 2010 and 2019 was $2,776. The highest export value per tonne was $3,641 in 2011 and the lowest was $2,202 in 2018. The 2018 export value per tonne was only 2% lower than the 2019 value of $2,245 per tonne.

Côte d'Ivoire, Ethiopia, Kenya, Uganda and Tanzania were the top five exporting countries in Africa between 2015 and 2019. Uganda was the top exporter in Africa during that period exporting an average of 249,184 tonnes per year. Rwanda exported 23,921 tonnes of coffee in 2019, 36% more than the 2010 export quantity of 17,571 tonnes. This was also the largest annual volume of exports for the period under study. The average YoY growth between 2010 and 2019 was 5%. Exports showed the effects of the alternate bearing cycles seen in the production of coffee with one year high followed by a low in the next year.

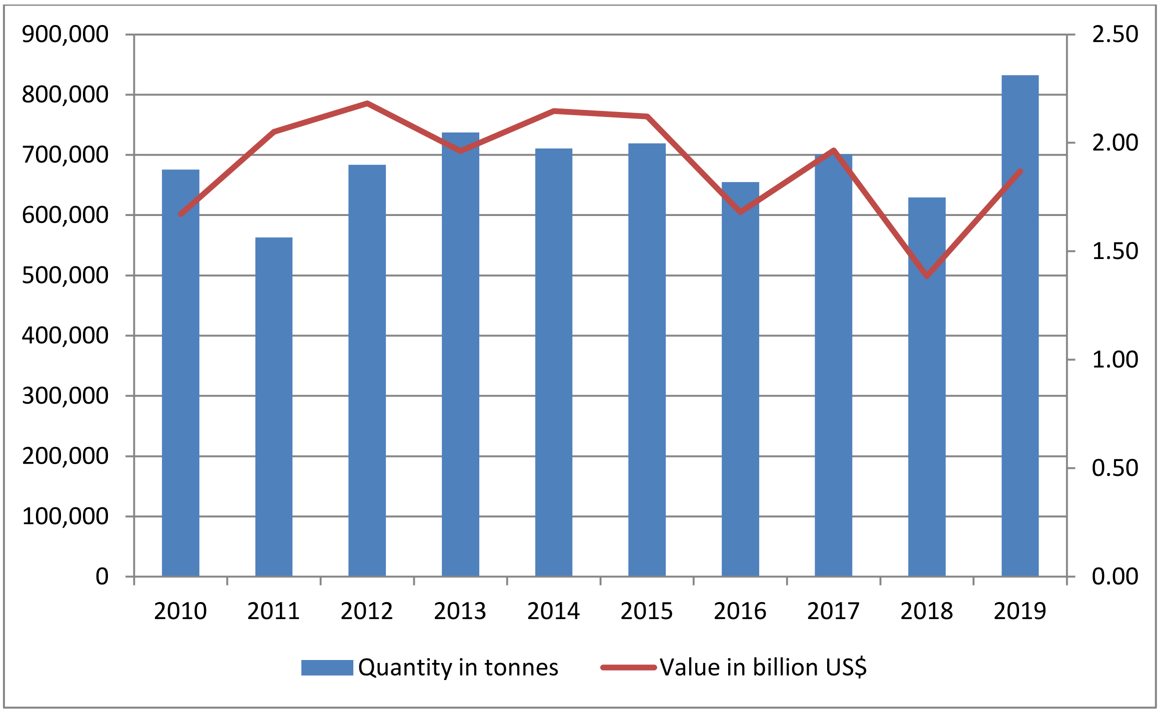

Fig. 22. Africa coffee export quantity and value
Source: FAOSTAT (www.fao.org/faostat)

The CAGR for the value of Rwanda's coffee exports was 2%. The value of exports fluctuated much like the quantity of exports in alternating cycle of one high year followed by a decline in the next year. The highest value of exports of US$72.54 million was recorded in 2011; a 30% increase from the previous year value of US$55.89 million and was followed by a decline of 3% the following year.

The average export value per tonne between 2010 and 2019 was US$3,521. The highest export value per tonne of US$5,023 was recorded in 2011. The lowest export value per tonne of US$2,909 was recorded in 2013. In 2019 the export value was US$2,982, slightly higher than the lowest value and the second lowest export value.

Table 6. Africa top coffee exporters

Country	2015	2016	2017	2018	2019
	Export in Tonnes				
Ethiopia	234,218	159,712	194,175	252,166	276,836
Uganda	219,336	210,584	286,998	111,254	238,372
Côte d'Ivoire	65,218	73,409	39,952	76,796	108,579
United Republic of Tanzania	57,820	57,925	41,363	56,347	67,648
Kenya	42,900	46,817	43,470	44,597	48,726
Cameroon	28,246	32,858	28,508	16,650	19,511
Rwanda	18,263	17,523	18,671	22,042	23,921
Burundi	12,901	16,198	11,842	17,293	21,519
Togo	10,849	4,202	1,940	5,979	5,497
Guinea	9,870	15,152	10,857	9,334	4,130
Democratic Republic of the Congo	4,492	4,171	5,564	6,140	7,582
Sierra Leone	3,243	2,800	2,333	2,800	2,803
Madagascar	3,062	4,485	1,767	1,300	240
Djibouti	2,301	2,432	2,509	1,943	1,415
South Africa	1,756	1,879	1,657	1,614	1,209
Burkina Faso	1,483	963	4,594	1,726	469
Malawi	959	813	520	721	429
Angola	630	446	526	537	1,312
Zimbabwe	432	667	128	211	316
Zambia	112	587	2,506	130	1,214

Source: FAOSTAT (www.fao.org/faostat)

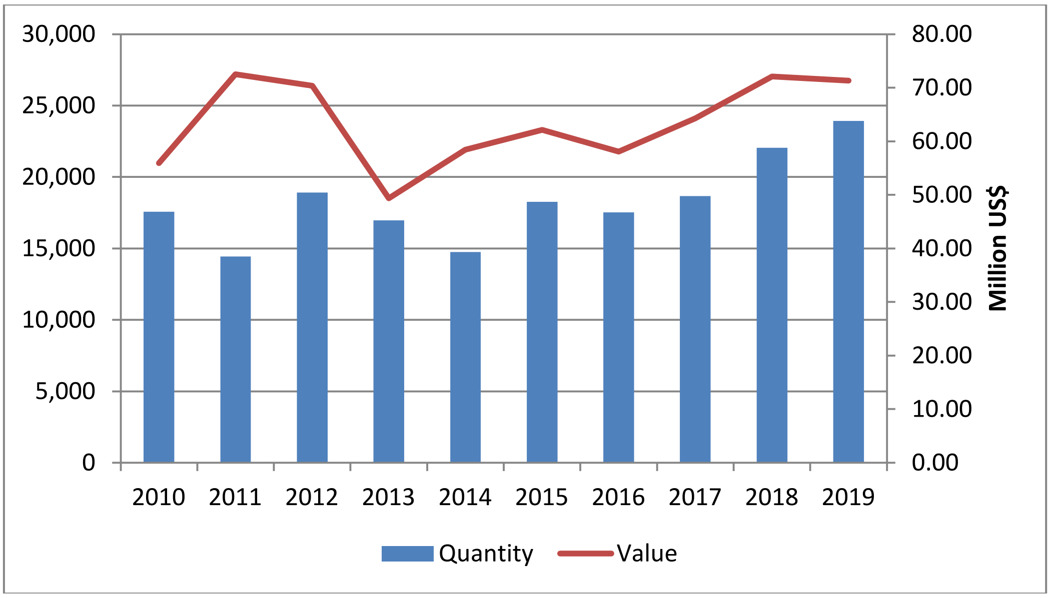

Fig. 23. Rwanda export quantity and value
Source: FAOSTAT (www.fao.org/faostat)

Rwanda's exports to Africa rose significantly 551 tonnes in 2011 to 18 124 tonnes in 2012. This was a growth of more than 3,000%. In 2012/2013 exports to Africa experienced a negative growth of -7% which carried on to 2015/2016 at an average of -41%. In 2016 611 tonnes were exported to Africa. Exports increased by nearly 300% to 2,432 tonnes in 2017. Exports to Africa were 2,361 tonnes in 2019. The value of exports was expectedly highest in 2012 at US$67.25 million. However, the highest value per tonne was recorded in 2011 when 551 tonnes of coffee were exported at an export value of US$2.63 million representing an export value of US$4,771 per tonne. The average export value per tonne between 2010 and 2019 was US$2,902.

The growth of exports to Africa was as a result of three factors. Firstly there was an economic crisis in Europe leading to lower prices from the region causing most producers to seek markets elsewhere [30]. Secondly, there was increased global supply of coffee during that period which also led to the seeking of alternative markets. Finally, Rwanda produced 54% of its coffee as semi-washed coffee. Uganda, Rwanda's biggest export partner in Africa, is a re-exporter of coffee, purchasing semi-washed coffee and re-washing it for re-export. This enabled Rwanda to sell its coffee to Uganda. This shift affected Rwanda's exports to all other regions between 2012 and 2014 [31].

Between 2010 and 2014 Rwanda exported coffee to five African countries – Eswatini, Kenya, South Africa, Uganda and Tanzania. Total exports to these countries for that period were 44,416 tonnes. Uganda was Rwanda's top export partner between 2010 and 2014 with 19,154 tonnes exported to Uganda or 43.12% of Africa's total exports. Exports to Tanzania were 16,292 tonnes (37%), Kenya 8,285 tonnes (19%), Eswatini 560 tonnes (1%) and South Africa 125 tonnes (0.28%).

Rwanda's exports to Africa declined from a total of 44,416 tonnes between 2010and 2014 to 8,906 tonnes between 2015 and 2019. Uganda continued to be Rwanda's top export partner with 56% of Rwanda's African exports going to Uganda. Kenya's 25% of Rwanda's exports to Africa meant they retained their position as Rwanda's second export partner after Uganda.

In 2019, Rwanda exported 1,090 tonnes to South Sudan and that total was 12% of Rwanda's exports between 2015 and 2019. Exports to South Africa, Tanzania and other African countries were 4%, 2% and 0.3% of total exports respectively.

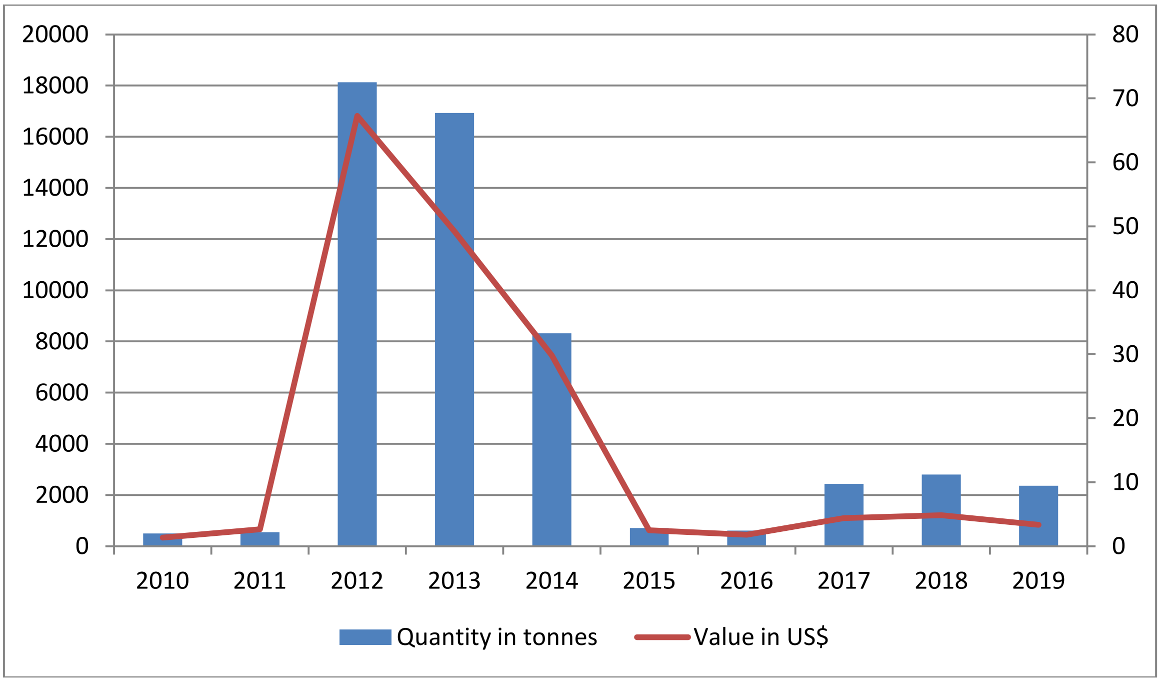

Fig. 24. Rwanda exports quantity and value to Africa
Source: FAOSTAT (www.fao.org/faostat)

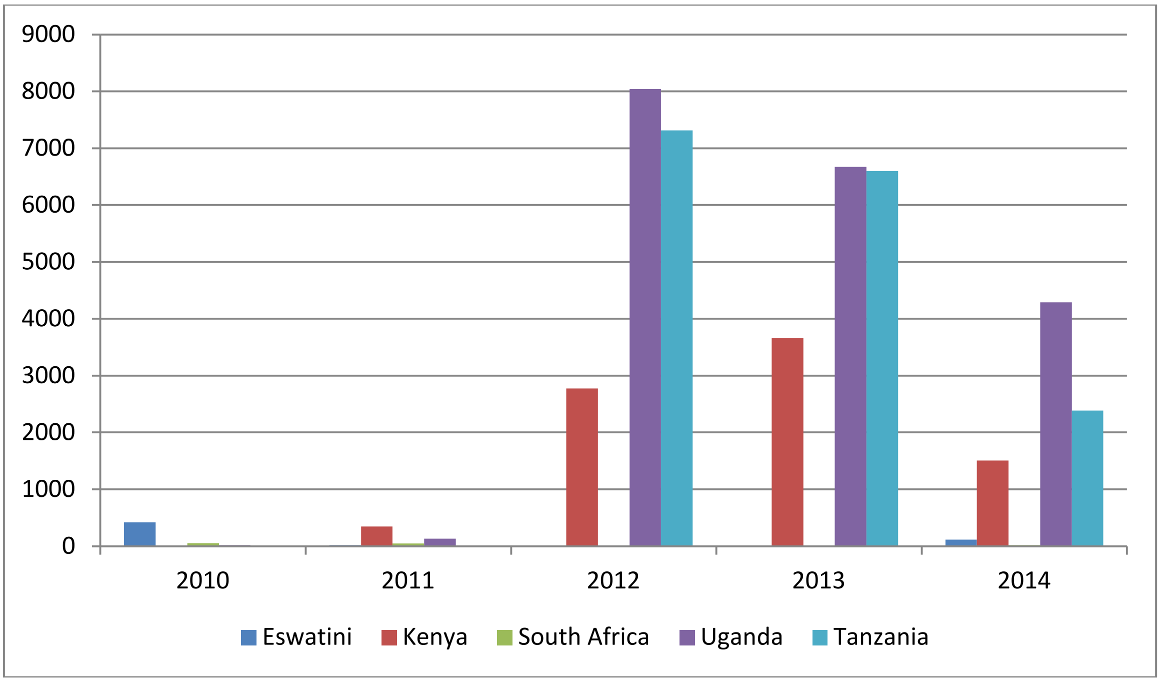

Fig. 25. Rwanda exports to African countries 2010-2014
Source: FAOSTAT (www.fao.org/faostat)

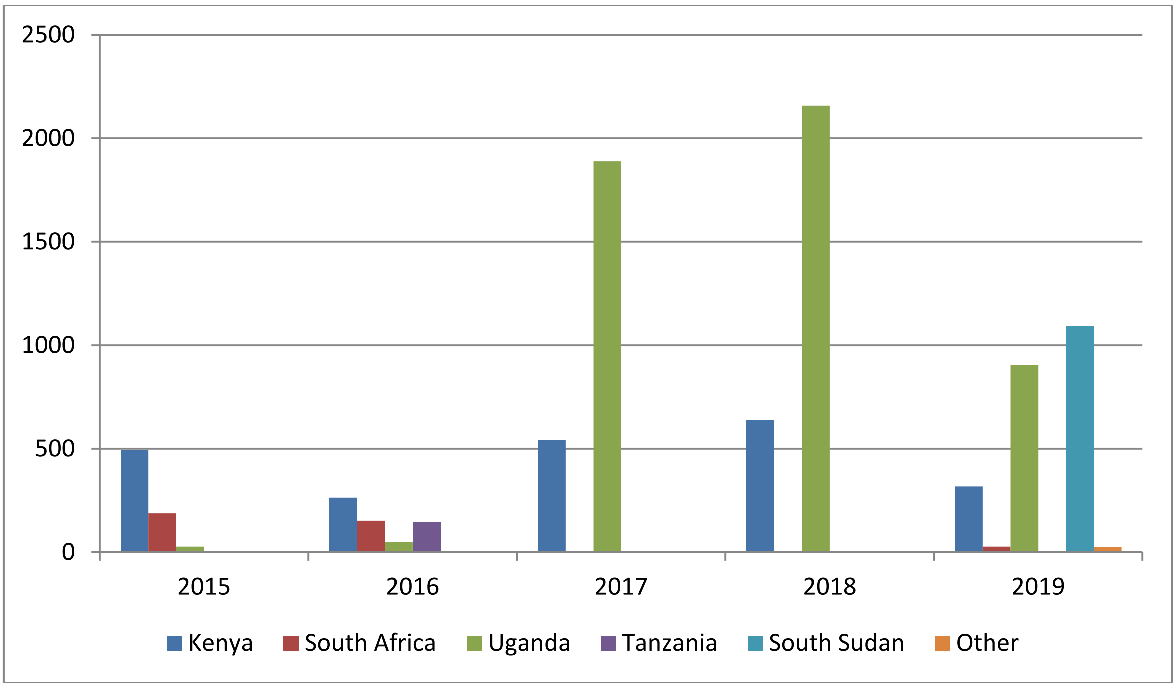

Fig. 26. Rwanda exports to African countries 2015-2019
Source: FAOSTAT (www.fao.org/faostat)

Rwanda's exports to the Americas were mainly to the United States of America. A total of 13,657 tonnes were exported to USA representing 98% of exports to the Americas. Rwanda did not export any coffee in 2012 and 2013.

Rwanda's exports to USA averaged US$5.75 million per year between 2010 and 2019. The average export value per tonne was US$3,439. The highest export value per tonne during the period was US$5,913 in 2011.

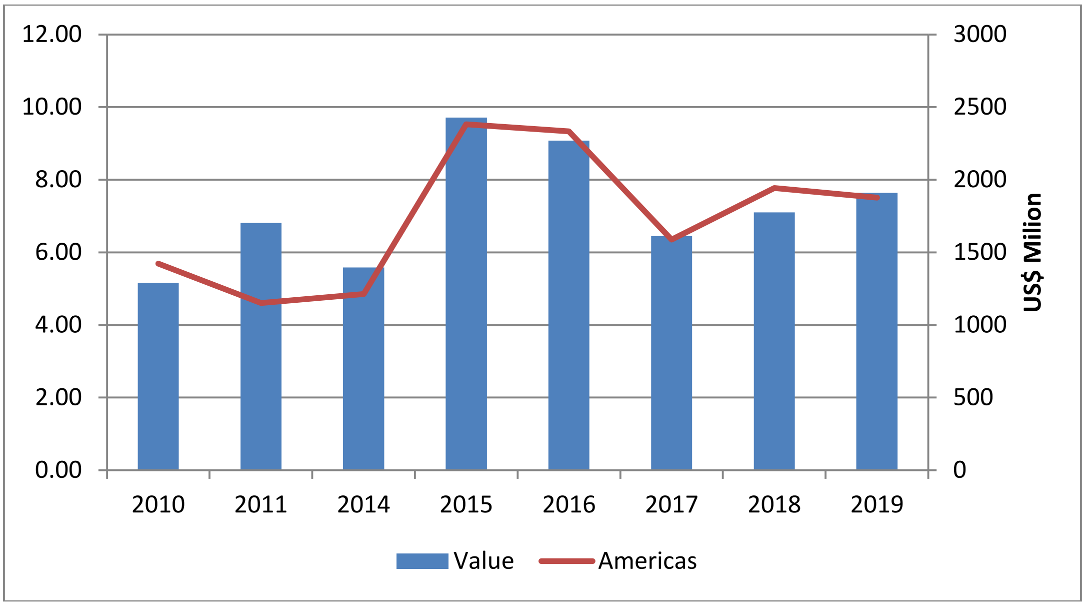

Fig. 27. Rwanda exports to the Americas
Source: FAOSTAT (www.fao.org/faostat)

In 2015, Rwanda exported 19 tonnes to Canada. There was a sharp rise to 139 tonnes in 2016 but this reduced drastically to 9 tonnes in 2017. 12 tonnes and 19 tonnes were exported to Canada in 2018 and 2019 respectively. In 2019, 56 tonnes of coffee were exported from Rwanda to Mexico.

Rwanda's exports to Asia rose from 110 tonnes in 2010 to 1,918 tonnes in 2019 at a CAGR of 33%. The highest export quantity to Asia was 1,971 tonnes in 2018. A total of 10,221 tonnes were exported to Asia between 2010 and 2019 at an average value of US$4.29 million per year. The export value was highest in 2018 corresponding with the highest quantity exported. However, the highest export value per tonne, US$14,000, was recorded in 2012 when 3 tonnes had an export value of US$42,000. The following year the export value per tonne reduced to US$11,333 when the same quantity recorded a value of US$34,000. This contributed significantly to Asia's high average export value per tonne of US$6,309 between 2010 and 2019. Comparatively, the average export value per tonne was US$4,198 between 2014 and 2019.

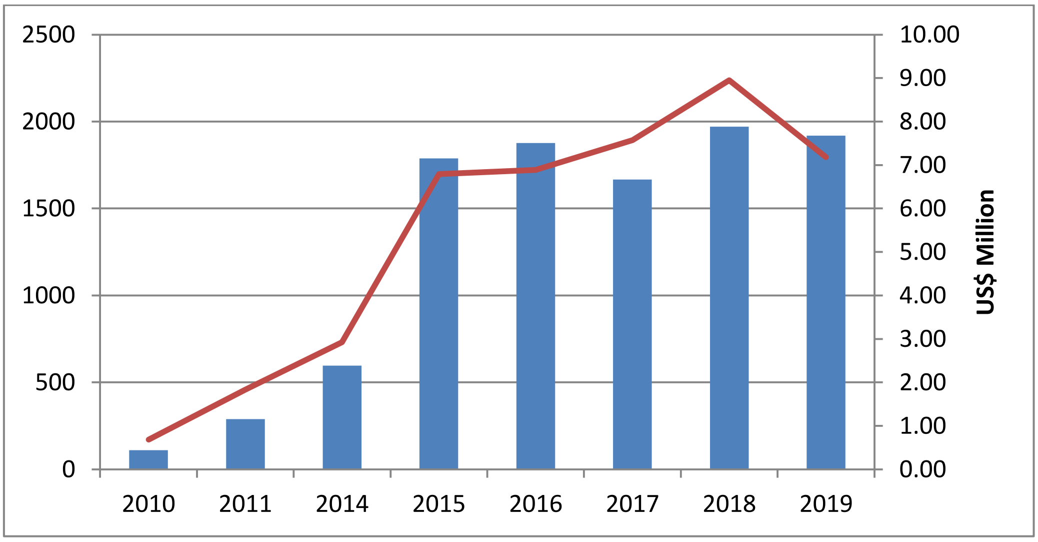

Fig. 28. Rwanda Exports to Value
Source: FAOSTAT (www.fao.org/faostat)

In 2019, Rwanda's exports to Singapore were 67% of total exports to Asia for that year. Exports to Japan were 17%, UAE 7% and the rest of Asia 9%.

Rwanda's exports to Europe were 15,533 tonnes in 2010 and dropped to 6 tonnes in 2013 at an average of -71% per year. Volumes exported increased to 4,532 tonnes in 2014 and grew at an average of 44% to reach 17,563 in 2019.

Exports to Asia averaged a value of US$36.92 million between 2010 and 2019. The highest export value was achieved in 2012 when 12,420 tonnes attained an export value of US$61.03 million translating to an export value per tonne of US$4,914; the highest during the period under study. The average export value per tonne was US$4,023.

An economic crisis in Europe and flooding of the coffee market in 2012 caused a reduction of prices of coffee. During that period Rwanda produced 54% of semi-washed coffee. As a result of the low prices prevailing in Europe, Rwanda exported most of its coffee to Uganda.

Belgium Switzerland and the United Kingdom of Great Britain and Northern Island were Rwanda's top 3 European export partners between 2010 and 2019. Switzerland, Rwanda's top European export partner, received 58,072 tonnes of coffee from Rwanda between 2010 and 2019. During the same period Belgium and the UK received 20,555 tonnes and 19,079 tonnes respectively. Exports to the top 3 countries reduced significantly in 2012 and 2013 with a total of 780 tonnes exported to all three during the period. Exports to both Switzerland and the UK were highest in 2019 – 8,756 tonnes and 5,744 tonnes respectively.

In 2019, just under 50% of Rwanda's exports to Europe were to Switzerland. Exports to the United Kingdom and Belgium were 32.71% and 13.92% respectively. Exports to the rest of Europe were 3.52% of total exports in 2019.

Exports to Oceania were 1,085 tonnes divided between Australia and New Zealand between 2010 and 2019. From 2010 to 2016 Rwanda exported 509 tonnes of coffee to Australia. Between 2017 and 2019 exports to Australia reduced to 79 tonnes. Exports to New Zealand began in 2016 with 35 tonnes exported in 2016 rising to 156 in 2019. Between 2016 and 2019 497 tonnes were exported to New Zealand.

The average export value to Oceania was US$667,400 between 2010 and 2019. The highest export value of US$1,277,000 was recorded in 2017. In 2012, 2 tonnes of coffee were exported to Australia at an export value of US$34,000 translating to US$17,000 per tonne. This was the highest export value per tonne between 2010 and 2019. Because of the high export value per tonne in 2012, the average export value per tonne between 2010 and 2012 was US$7,369. However, the average export value per tonne between 2013 and 2019 was lower at US$6,018.

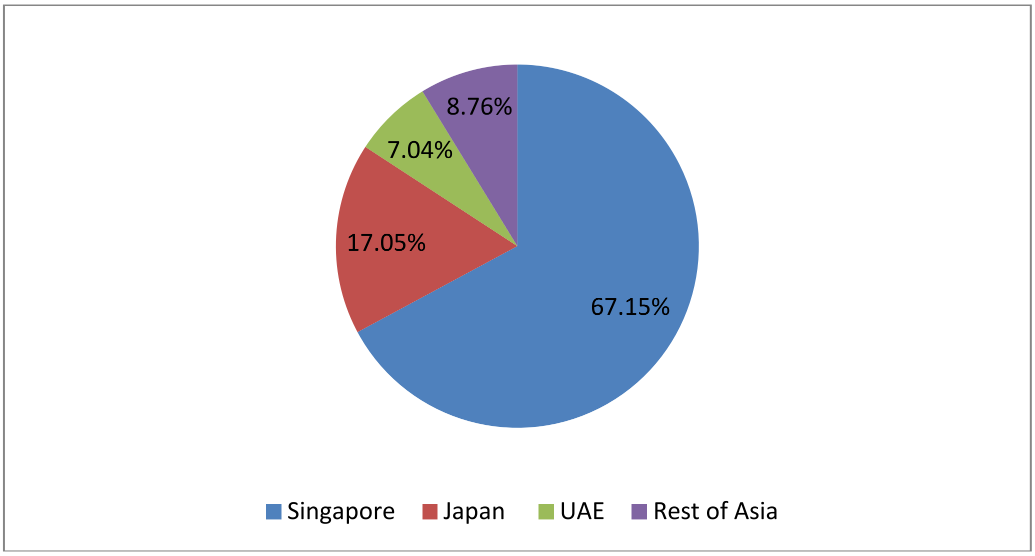

Fig. 29. Rwanda Exports to Asian Countries
Source: FAOSTAT (www.fao.org/faostat)

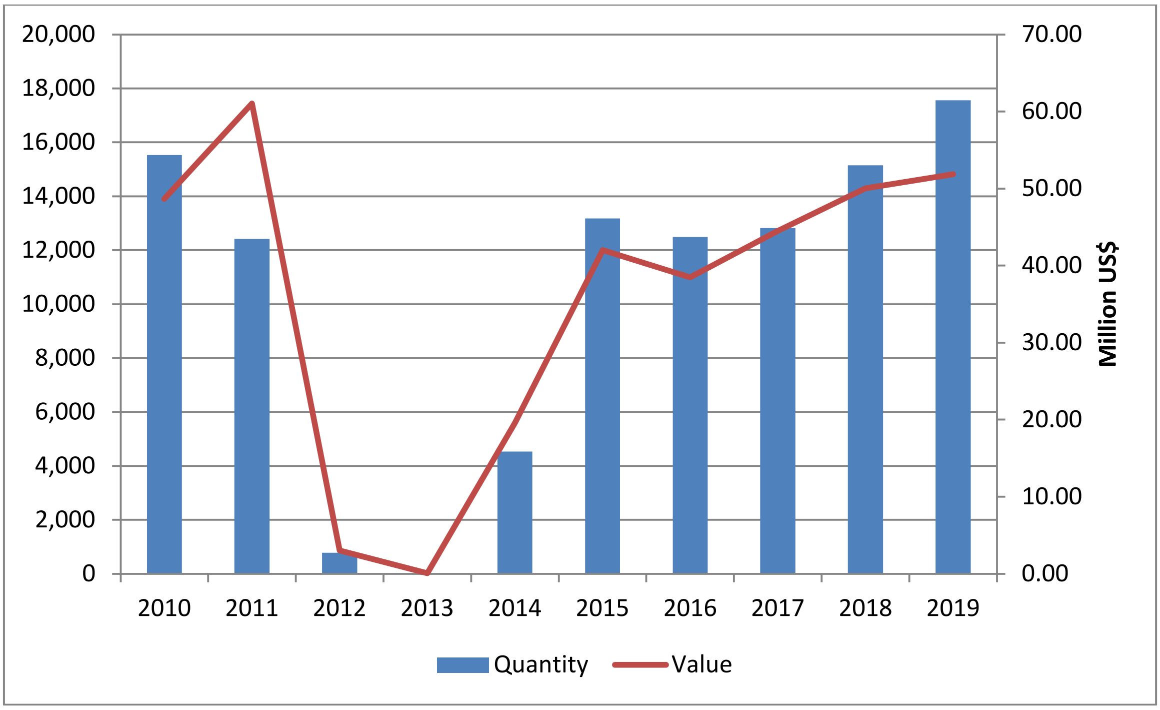

Fig. 30. Rwanda Exports to Europe
Source: FAOSTAT (www.fao.org/faostat)

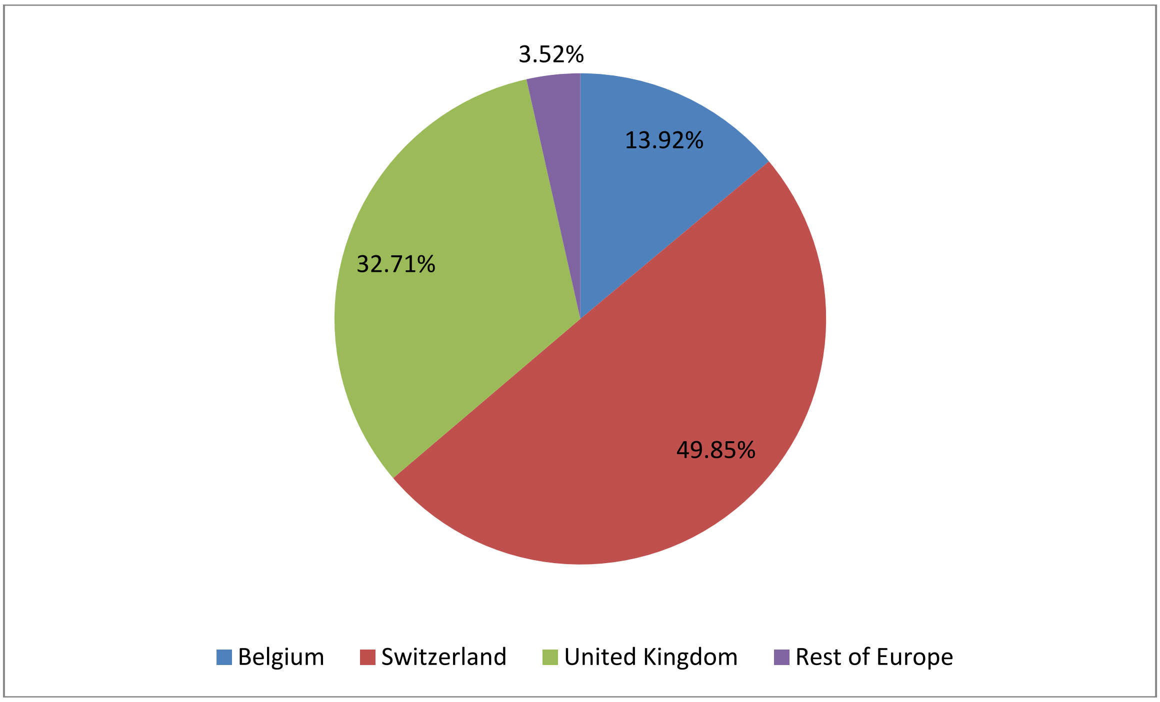

Fig. 31. Distribution of Rwanda Exports to Europe
Source: FAOSTAT (www.fao.org/faostat)

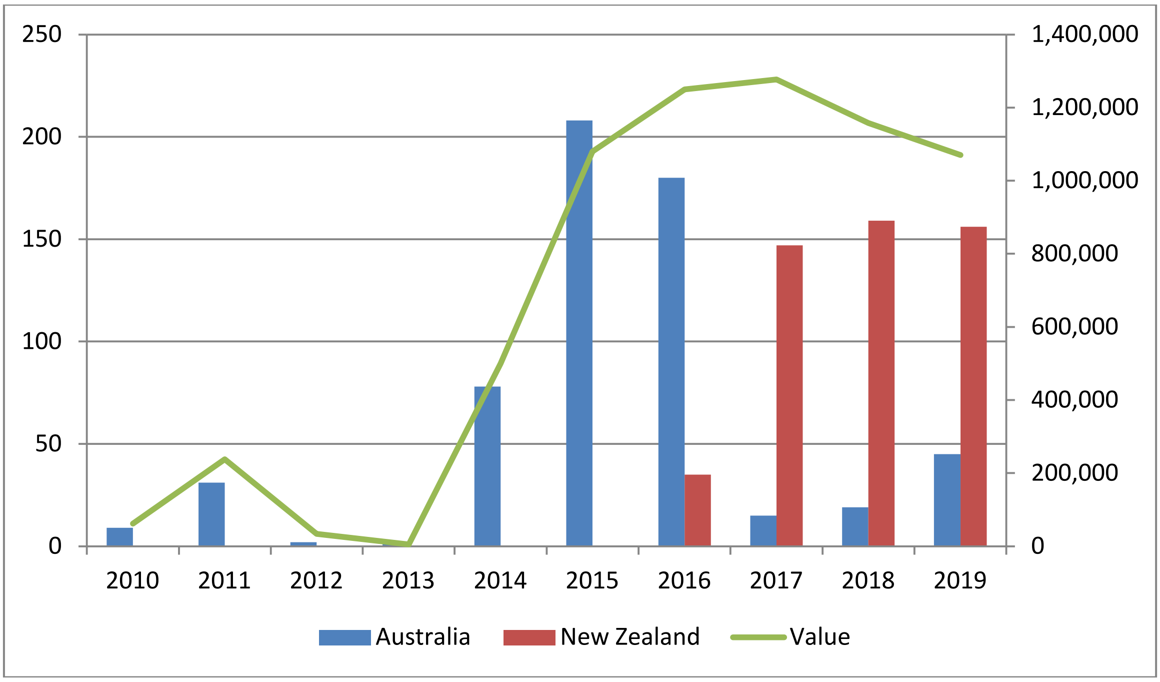

Fig. 32. Rwanda Exports to Oceania
Source: FAOSTAT (www.fao.org/faostat)

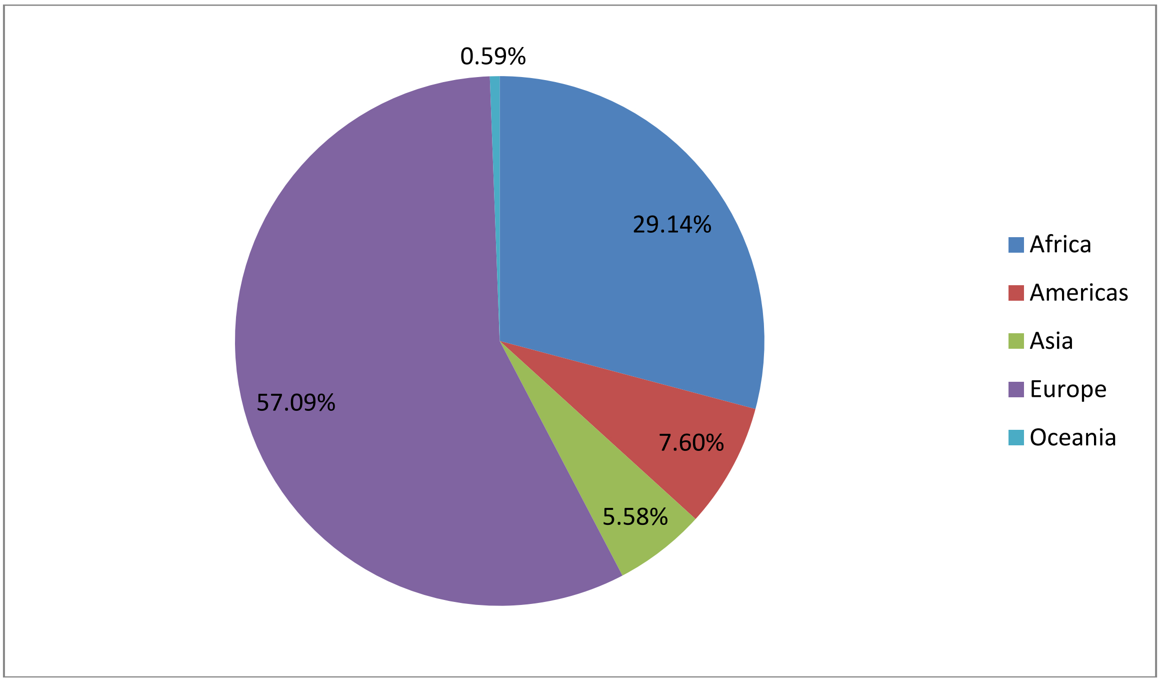

Fig. 33. Geographic Distribution of Rwanda Coffee Exports
Source: FAOSTAT (www.fao.org/faostat)

The majority of Rwanda's coffee (57%) was destined for European markets between 2010 and 2019. Exports to Africa were 29% of total exports to all regions between the same periods. Exports to the Americas, Asia and Oceania were 8%, 5.585 and 1% respectively.

Export value between 2010 and 2019 was expectedly higher from Europe. However the highest export value in a single year was from Africa at US$67.26 million in 2012. During this year export to other regions fell drastically as exports to Africa grew significantly. Export value (and exports) continued to be significantly higher in Africa and low in other regions up to 2014. In 2014, although Europe's export value of US$19.60 million was lower than the ten year average of US$35.92 million it marked the beginning of an increase in export value from Europe. From 2015 to 2019 the average export value was US$45.37 million.

Table 7. Rwanda export value by region

Year	Africa	Americas	Asia	Oceania	Europe
	Value in million US$				
2010	1.345	5.163	0.68	0.062	48.64
2011	2.629	6.812	1.83	0.238	61.03
2012	67.246	0.001	0.04	0.034	3.01
2013	49.203	0.000	0.03	0.005	0.05
2014	29.802	5.586	2.92	0.5	19.60
2015	2.459	9.79	6.79	1.08	42.01
2016	1.785	9.666	6.88	1.25	38.46
2017	4.391	6.507	7.58	1.277	44.50
2018	4.812	7.172	8.95	1.158	50.02
2019	3.315	7.927	7.18	1.07	51.85

Source: FAOSTAT (www.fao.org/faostat)

Table 8. Rwanda's top export partners

Country	2015	2016	2017	2018	2019
	Export in Tonnes				
Switzerland	6642	7437	6835	8012	8756
Belgium	4168	2083	1142	1960	2445
United States of America	2363	2195	1578	1931	1802
Singapore	1375	1398	1145	1267	1288
Germany	967	339	72	92	224
United Kingdom	878	825	4623	4932	5744
Kenya	494	263	542	637	318
Australia	208	180	15	19	45
Japan	205	206	176	290	327
Finland	190	596	0	0	0
South Africa	187	152	0	0	26
Republic of Korea	111	183	290	347	71
Italy	97	552	1	0	92
Norway	89	65	12	15	19
Latvia	63	0	1	0	0
Romania	38	58	0	0	0
China, mainland	33	18	31	34	63
Netherlands	27	18	20	5	130
Uganda	26	50	1889	2157	904
Saudi Arabia	23	35	0	0	0
Democratic People's Republic of Korea	21	0	0	0	0
Türkiye	20	0	20	20	
Canada	19	139	9	12	19
Denmark	19	77	0	0	0
New Zealand	0	0	147	159	156
Sweden	0	0	45	43	22
Poland	0	0	32	36	63

Source: FAOSTAT (www.fao.org/faostat)

Oceania and Asia had the highest average export values per tonne between 2010 and 2019 at US$7,369 and US$6,309 respectively. This was as a result of uncharacteristically high export values per tonne of US$17,000 and US$14,000 in 2012 respectively. Europe's average export value per tonne was US$4,023 between 2010 and 2019. Africa had the lowest average export value per tonne at US$2,902.

3.6 Rwanda Export Partners

Switzerland was Rwanda's top export partner in 2019 receiving 8,756 tonnes of coffee from Rwanda. The UK was ranked second with 5,744 tonnes. Belgium (2,445 tonnes), USA (1,802 tonnes) and Singapore (1,288 tonnes) completed the top 5 of Rwanda's export partners in 2019. Exports to South Sudan were the sixth highest in 2019 at 1,090 tonnes. Uganda, Kenya, Japan and Germany completed the bottom half of the top 10.

Rwanda Invested in storage facilities in an attempt to reduce the vulnerability of the coffee sector to global price volatility (Agritrade, 2014). As a result, Rwanda stores the bulk of its coffee when international prices are low and thereby exports less and only sells when prices are high. This system has resulted in reductions in quantities exported to some countries and increases to other countries particularly in Africa.

Rwanda exported 37,682 tonnes of coffee to Switzerland between 2015 and 2019 at an average of 7,536 tonnes per year. Exports to Switzerland grew an average YoY growth rate of 8% between 2015 from 6,652 tonnes in 2015 to 8,756 tonnes in 2019. The CAGR for Rwanda's exports to Switzerland was 6%.

Exports to UK rose sharply from 825 tonnes in 2016 to 4,623 tonnes in 2017 a growth of 460%. In 2019, exports to the UK were 5,744 tonnes. The average YoY growth rate between 2015 and 2019 was 11%. The CAGR for Rwanda's exports to the UK was 46% between 2015 and 2019.

Rwanda's exports to Belgium fell from 4,168 tonnes in 2015 to 1142 tonnes in 2017. In 2019, exports to Belgium were 2,445 tonnes. The average YoY growth rate was 0.29% between 2015 and 2019. The CAGR between 2015 and 2019 was -10.12%.

Rwanda's exports to the USA declined from 2,363 tonnes in 2015to 1,578 tonnes in 2017. Following an increase to 1,931 tonnes in 2018 the export quantity decreased again to 1,802 tonnes in 2019. The average YoY growth rate between 2015 and 2019 was -5%. The CAGR for the same period was-5%.

Rwanda exported 6,473 tonnes to Singapore at an average of 1,295 tonnes a year between 2015 and 2019. The highest export volume of 1,398 tonnes was recorded in 2016. The average YoY growth rate was -1% and the CAGR was -1%.

Rwanda exported 4,950 tonnes of coffee Uganda at an average of 1,650 tonnes per year between 2017 and 2019. The highest volume of exports was in 2018 at 2,157 tonnes. This decreased significantly to 904 tonnes in 2019. The average YoY growth rate was -22% between 2017 and 2019.

Global coffee imports reached 7.81 million tonnes in 2019 from 6.25 million tonnes in 2010 at an average YoY growth rate of 3%. Although the growth rate for coffee imports rose and fell year after year, coffee import quantity recorded negative growth (-1 %) only once in 2016/2017.

The average import value per tonne was US$3,139 between 2010 and 2019. Import value per tonne was highest at US$4,390 in 2011 while the lowest was recorded in 2019 at US$2,494. The highest import value of US$28.32 billion was recorded in 2011 and the lowest, US$19.47 billion, was recorded in 2019.

The United States of America was the world's leading coffee importer in 2019 importing 1.59 million tonnes. The USA and Germany, the second highest importing country in 2019, imported 2.73 million tonnes representing 35% of global imports. The rest of the world, excluding the top 10 importing countries, imported 33 %. The top 10 importing countries list was made up of 7 countries from Europe, 1 from Asia and 2 from the Americas.

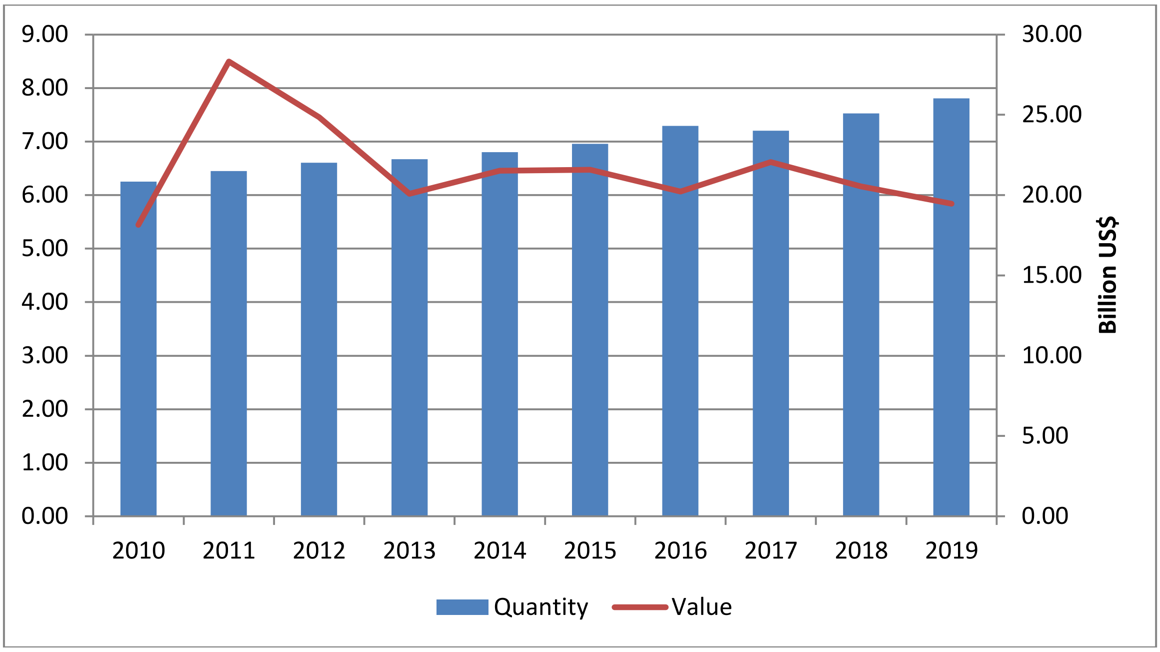

Fig. 34. World imports quantity and value
Source: FAOSTAT (www.fao.org/faostat)

Table 9. Rwanda's top coffee importers

Country	2015	2016	2017	2018	2019
	Imports in Tonnes				
United States of America	1462570	1518126	1531321	1493440	1592249
Germany	1077757	1140989	1098833	1124983	1135347
Italy	533180	580274	569916	606995	615972
Japan	435261	435140	406330	401144	436546
Belgium	287383	288740	276473	281344	307542
Spain	278654	287504	273842	289358	305035
France	218429	209884	204873	227463	230018
United Kingdom	171051	178347	165863	196962	189611
Canada	169498	183894	202563	200584	208843
Netherlands	159254	166334	190214	202696	206382
Switzerland	148404	151644	156288	167538	175318
Russian Federation	137566	150932	165410	168540	185616
Republic of Korea	129567	142860	147501	145051	152013
Algeria	128733	138298	130312	115000	120681
Poland	104254	103554	117070	123005	123428
Sweden	98895	110652	108409	106763	111507
Malaysia	82841	86962	90025	103634	110028
Australia	82256	83039	91376	92102	95711
Finland	67712	71324	67392	61230	75052
India	65312	71002	76082	83932	83661
Thailand	57116	46085	55417	62658	37172
Saudi Arabia	50464	44108	52398	55176	48694
China, mainland	49298	50573	48012	51034	52192
Portugal	48672	53628	52073	55347	57193
Mexico	48027	65669	31232	22700	39771

Source: FAOSTAT (www.fao.org/faostat)

4. CONCLUSIONS

Historical overview highlightthe impact the impact of colonialismtime in Rwanda on agriculture production due to the land laws that continue to limit farmers who find it difficult to claim ownership of their land. The genocide destroyed infrastructure that was crucial for the development of the coffee sector. However, a lot of focus is being put towards recovery and the coffee market is expected to grow at a compound annual growth of 4% between 2022 and 2028. The study shows that this growth is mainly due to rising capita per income, the efforts of Rwanda's National Agriculture Export Board, cultural shifts resulting in increased uptake in coffee consumption and increasing urban populations.Furthermore, the production of Rwanda's coffee dating back to the colonial era and covering the genocide era makes Rwandan coffee a tourist product. Interventions by the Rwandan government to make Rwanda a specialty coffee producing nation included drafting a regulatory framework to guide the production of coffee, building more wash stations necessary for the production of high quality coffee, engaging international organisations and donors, including other stakeholders in governance and eventually liberalisation of the coffee industry in Rwanda. Liberalisation in particular led to growth of rural communities through job creation, increased income and opportunities and skill development. The study shows that Rwanda benefits from climatic and environmental conditions that are conducive for the production of coffee [32-38]. However, climate change, poor soil and pest management, poor management of wash stations, poor transport infrastructure and land ownership problems continue to be a limitation to the production of coffee in Rwanda.

The role of coffee to the development of Rwanda's economy is very significant both from production point of view (as an important trade good with positive trade balance being foreign currency earning product) and as a major employer sector of agriculture (changing the livelihoods of thousands of farmers and rural communities). The government of Rwanda intervened admirably to counter the effects of the genocide on the coffee sector and position Rwanda's coffee as one of the best in the world Rwanda produced an average of 25,118 tonnes of coffee between 2010 and 2019. The average area harvested during that period was 40 000 hectares. In 2019 the yield rate was 1.35 tonnes/hectare while the average between 2010 and 2019 was 0.78 tonnes per hectare [39-45]. The average global yield rate between 2010 and 2019 was 0.87 tonnes per hectare and that for Africa was 0.44 tonnes per hectare however, there still remains a lot that can be done to ensure that Rwanda reaches the full economic potential of its coffee production and export. Rwanda has the potential to increase the area under coffee production to compliment the extensive measures that are already being taken to increase coffee productivity. There is need to improve the management and maintenance of coffee plantations and to continue to educate the farmers in good agricultural practices.

Rwanda exported an average of 20,000 tonnes of coffee between 2010 and 2019 at an average of US$3,521 per tonne. The average global value per tonne was US$2,899 during the same period. Rwanda exported most of its coffee to Europe exporting 10,448 tonnes at a value of US$4,023 per tonne. Exports to Africa averaged 5,332 tonnes at a value of US$2,902. Most of the coffee exported to Africa was semi-washed coffee although the volatility of coffee prices is high, Rwanda needs to ensure that it produces high quality coffee for export. This includes taking steps to increase the amount of fully washed coffee available for export. Measures that can be taken to ensure the farmers are incentivised to take their coffee to coffee washing stations include improving the quality of service and management of the washing stations and setting minimum farm gate prices that are favourable to the farmers at the washing stations. Favourable farm gate prices will ascertain that farmers get the best value for their labour and will continue to produce good quality coffee.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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