TOURISM RESEARCH INSTITUTE

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ASSESSING THE

IMPACT OF COVID-19 ON KENYA'S TOURISM

AND THE MULTIPLIER EFFECTS ON THE COUNTRY'S ECONOMY

MARCH 2020 TO SEPTEMBER 2021

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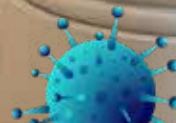
MARCH 2020 TO SEPTEMBER 2021

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ABBREVIATIONS

CBK	Central Bank of Kenya
GDP	Gross Domestic Product
GFCF	Gross Fixed Capital Formation (Total Investment Less Financial Investment)
ISIC	International Standards Industrial Classification of all Economic Activities
KNBS	Kenya National Bureau of Statistics
KTB	Kenya Tourism Board
MRIO	Multi-Region Input-Output Table database
OECD	Organization for Economic Cooperation and Development
SUT	Supply and Use Table
TCC	Tourism Collective Consumption
TSA	Tourism Satellite Accounts
TSA: RMF	TSA Recommended Methodological Framework (2008)
TRI	Tourism Research Institute (Kenya)
UNECA	United Nations Economic Commission for Africa
UNWTO	United Nations World Tourism Organization
WTTC	World Travel and Tourism Council

Foreign Exchange Rate: 1US$=Kshs.107.5 (Mean CBK rate for 2020/21)

GLOSSARY

Domestic tourism consumption - Domestic tourism consumption is the tourism consumption of a resident visitor within the economy of reference. Total consumption by a domestic tourist.

Inbound tourism consumption - Inbound tourism consumption is the tourism consumption of a non-resident visitor within the economy of reference. Consumption by a foreign tourist within the country visited.

Internal tourism consumption - Internal tourism consumption is the tourism consumption of both resident and non-resident visitors within the economy of reference. It is the sum of domestic and international tourists' consumption.

National tourism consumption - National tourism consumption is the tourism consumption by resident visitors, within and outside the economy of reference. It is the sum of domestic tourism consumption and outbound tourism consumption.

Outbound tourism consumption - Outbound tourism consumption is the tourism consumption of a resident visitor outside the economy of reference. Consumption by outbound tourists within the destinations visited.

Output is the value of production, and is equal to Value Added Plus **Intermediate Expenditures**. Intermediate expenditure is the money spent in purchasing inputs (good and services) to create an industry's production. It can further be understood as the worth of business generated in the given industry for a given period.

Value Added is the combination of Labour Income, **Other Property Type Income and Indirect Business Taxes**. Other Property Type Income (OPTI) includes corporate profits, interest income, and rental payments, while Indirect Business Taxes (IBT) is taxes collected by businesses on behalf of the government. These include sales tax, excise tax, property tax, fees, fines, and licenses. Hence, Value Added accounts for all non-commodity payments associated to an industry's production.

Labour Income is composed of two components. These are **Employee Compensation** –the wages and benefits paid to wage and salary employees, and **Proprietor Income** –the profits earned by self-employed individuals. Thus labour income demonstrates a complete picture of the income paid to the entire labour force within the Model.

Employment is defined to include full and part-time annual average jobs for both employees and self-employed workers. Thus IMPLAN jobs look at all workers, regardless of their average hourly work week. Because this definition is based on annual average employment, seasonal workers are also accounted for in the Employment numbers, so if 12 hotel workers each worked six months of the year, they would account in IMPLAN for 6 annual jobs. This methodology differs from some data sets that look at the number of employees at any point-in-time within an industry

Output multiplier: An output multiplier for a sector is defined as the total production in all sectors of the economy that is necessary to satisfy a dollar's worth of final demand for that sector's output. Every dollar change in final-demand spending (direct output) changes the total value of output in all sectors. In other words, this multiplier measures the effects generated by an extra unit of final demand on the output of industries in an economy, where output is equal to sales plus the increase in the value of stocks.

The income multiplier: Measures the relationship between the direct and total income earned by households as generated

by a unit of final demand i.e. additional 'compensation of employees' paid to workers producing the extra output

The value added multiplier: Measures value added at factor cost due to the change in output as generated by an extra unit of final demand. It relates to the additional value-added, which is the sum of the compensation of employees, GOS and mixed income, and taxes less subsidies.

The employment multiplier: This multiplier measures the ratio of direct and secondary employment to direct employment generated by an additional unit of final demand. This multiplier is usually expressed in terms of an increase of 'N' full time equivalent employees (FTEs) per million dollars of extra spending. In other words, for every million-dollar change in final-demand spending (direct output), the change in employment (jobs).

Total Effects: Total multipliers include the full range of flow-on effects generated by an increase in economic activity. Thus, the total output multiplier is the total amount induced by the requirement from all industries to produce output to satisfy the demand for an extra dollar of output from an industry, and by the spending of the extra wage and salaries earned from producing the output by households (consumers).

Direct effect: production changes associated with changes in demand for the good itself; it is an initial impact on the economy.

Indirect effect: the secondary impact caused by changing input needs of directly affected industries (e.g., additional input purchases to produce additional output).

Induced effect: caused by changes in household spending due to the additional employment generated by direct and indirect effects.

Tourism consumption: Tourism consumption

has the same formal definition as tourism expenditure. Nevertheless, the concept of tourism consumption used in the Tourism Satellite Account goes beyond that of tourism expenditure. Actually, besides the amount paid for the acquisition of consumption goods and services, as well as valuables for own use or to give away, for and during tourism trips, which corresponds to monetary transactions (the focus of tourism expenditure), it also includes services associated with vacation accommodation on own account, tourism social transfers in kind and other imputed consumption. These transactions need to be estimated using sources different from information collected directly from the visitors, such as reports on home exchanges, estimations of rents associated with vacation homes, calculations of financial intermediation services indirectly measured (FISIM), etc.

Gross fixed capital formation: the total value of a producer's acquisitions, less disposals, of fixed assets during the accounting period plus certain additions to the value of non-produced assets realized by the productive activity of institutional units. Fixed assets are tangible or intangible assets produced as outputs from processes of production that are themselves used repeatedly or continuously in other processes of production for more than one year

Tourism collective consumption: based on governments role to provide selected goods and services to the community on a non-market basis and to redistribute income and wealth by means of implicit or explicit transfer payments.

Total tourism internal demand (TTID)- Total tourism internal demand, is the sum of internal tourism consumption, tourism gross fixed capital formation and tourism collective consumption. It does not include outbound tourism consumption.

EXECUTIVE SUMMARY

In order to understand the effects of Covid-19 on tourism and their impacts on Kenya's economy, this report focuses on inter-industry linkages and multiplier effects of expenditure.

Multipliers can be used to analyse the impacts and effects of changes in tourism demand; policies and regulations that affect tourism activity either directly or indirectly; factors beyond the direct control of the industry; public and private investment proposals; resource allocation; and policy and management of tourism development strategies.

The primary objective of this study was, therefore, to evaluate the effects of Covid-19 on tourism and the consequential impacts on the economy for the year 2020/21. The input-output/Social Accounting Matrix (SAM) models were used to estimate the impacts and linkages of tourism in terms of output production, employment generation, labour income earnings and total value creation.

The relationships between expenditure and output, and income and employment (direct, indirect or induced) are described by multipliers. Data for analysis was sourced from the multi-region input-output table (MRIO) database: http://www.worldmrio.com/ and the Kenya Tourism Satellite Accounts (2019).

All impacts have a starting point in the economy, defined as the direct effect. The direct effect sets off iterations of indirect (inter-industry production) and induced (labour) spending.

Internal tourism consumption is an aggregate that describes the size of direct visitor acquisition within a country of reference i.e. inbound and domestic tourism combined.

There are several different types of multipliers depending on the secondary effects included and the measure of economic activity used. The common multipliers computed were associated with output, income, value addition and employment in the economy for the year 2020-21.

Kenya's economy lost 1.2 million full time equivalent jobs, Kshs152 billion in labour income, Kshs419 billion in value addition and Kshs776 billion in output as a result of Kshs815 billion loss in direct earnings from both international and domestic tourism.

Overall, the economy lost 2.9 million full time equivalent jobs, Kshs414 billion in labour income, Kshs1.0 trillion in value addition and Kshs1.7 trillion in output as a result of Kshs815 billion loss in earnings by the country's inbound and domestic tourism.

This study analysed only one component of Total Tourism Internal Demand (TTID) i.e. Internal Tourism Expenditure/Consumption (ITE/C). Future studies should consider including Tourism Gross Fixed Capital Formation (TGFCF) and Tourism Collective Consumption (TCC).

1. INTRODUCTION

1.1 BACKGROUND

According to UNWTO World Tourism Barometer (Update September 2021), international tourism arrivals (overnight visitors) in the first seven months of 2021 were 40% below the levels of 2020. This was still 80% down when compared to the same period of pre-pandemic year 2019. Following a weak start of the year, international tourism made a small improvement during the months of June and July 2021 due to the reopening of many destinations to international travel. The relaxation of travel restrictions to vaccinated travellers, together with progress made in the roll-out of COVID-19 vaccines eased travel restrictions, lifted consumer confidence and gradually restored safe mobility in several parts of the world.

Asia and the Pacific continued to record the weakest results in January-July 2021, with a 95% drop in international arrivals compared to the same period in 2019 (Figure 1.1). The Middle East (-82%) recorded the second largest decline, followed by Europe and Africa (both -77%). The Americas (-68%) experienced a comparatively smaller decrease.
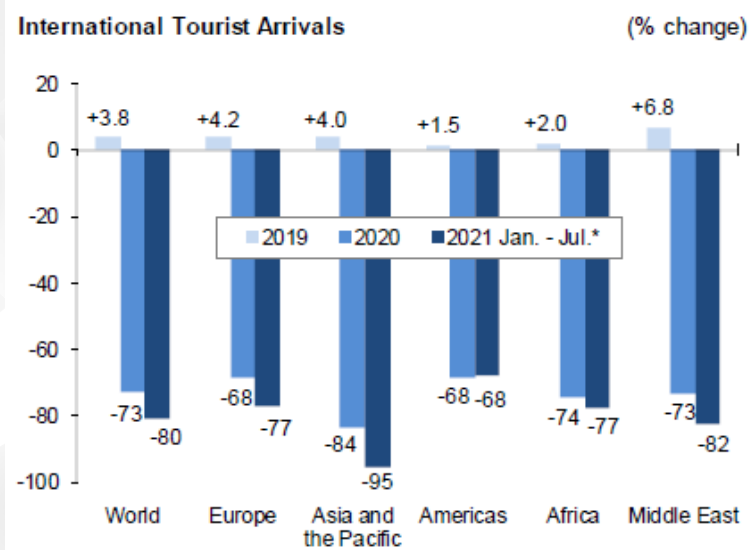
Figure 1.1 International Tourist Arrivals

Despite the relative improvement over the low levels of 2020, international tourism remained well below 2019 levels.

Domestic travel continued to drive the recovery of tourism in several destinations, especially those with large domestic markets. However, the rebound in domestic travel in many markets has not compensated for the large drop in international tourism.

1.2 TOURIST ACTIVITIES PRIOR TO COVID19 PANDEMIC

The tourism sector in Kenya is one of the key sources of growth for the country's economy and had shown impressive growth in years 2018 and 2019 both in the international and domestic markets. In January and February 2020, the impact of COVID-19 pandemic had not been felt in Kenya. International tourist arrivals and earnings in January and February 2020 were therefore comparable to a similar period in 2019. However, with exponential escalation in confirmed cases globally in March, most airlines grounded their flights, countries moved to impose travel restrictions and a raft of other measures to stem the spread of the pandemic. Operations in the travel, tourism and hospitality industry rapidly declined escalating to total closure of businesses.

This section presents pre-covid19 tourism performance trends, initial impact projections and intervention strategies following the effects of Covid-19 on tourism and the resultant impacts on the economy.

1.2.1 TOURISM PARTICIPATION

Although the leisure market remains seasonal, the growing proportions of MICE and business tourism market as well as the other segments in the recent years has gradually been flattening Kenya's tourism seasonality curve (Table 1.1).

Table 1.1: Inbound Tourism by Purpose of Visit

Purpose of visit	Holiday	MICE and Business	Visiting Family and Friends	Others (medical, shopping, education etc.)
2016% Proportions	72	11	8	9
2019% Proportions	63.15	13.5	10.6	12.75

Source: KTB and TRI

Before the on-set of Covid-19, the flow of inbound tourists into the country was generally evenly spread out throughout the year with the months of July and August serving as the peak season.

Kenya's international tourism arrivals dropped drastically with the onset of Covid-19 pandemic in March 2020 (Figure 1.2).
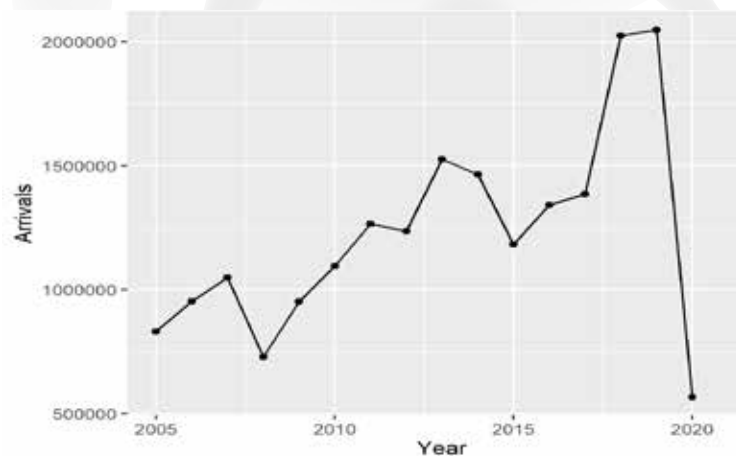
Figure 1.2 Trends of International tourist arrivals per year for 2005 to 2021

According to monthly international tourist arrivals, the months of July and August 2020 experienced the highest drop in arrivals (Figure 1.3).
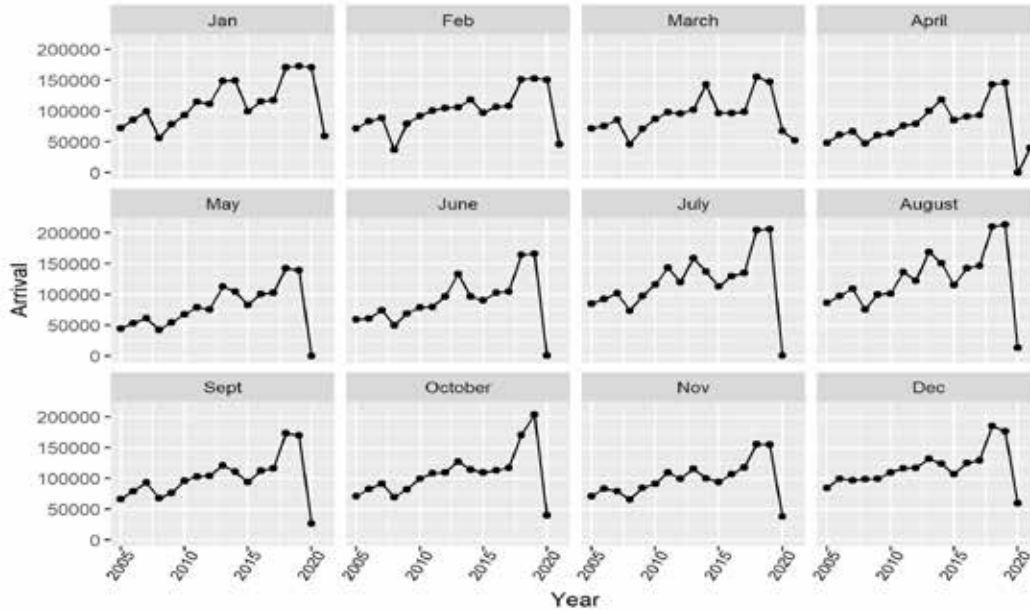
Figure 1.3 Monthly trends comparison of international tourist arrivals for the period 2005 to 2021

Yearly arrivals indicate that 2020 was hit hardest from the month of March till December with the worst performing period being between April and July (Figure 1.4).
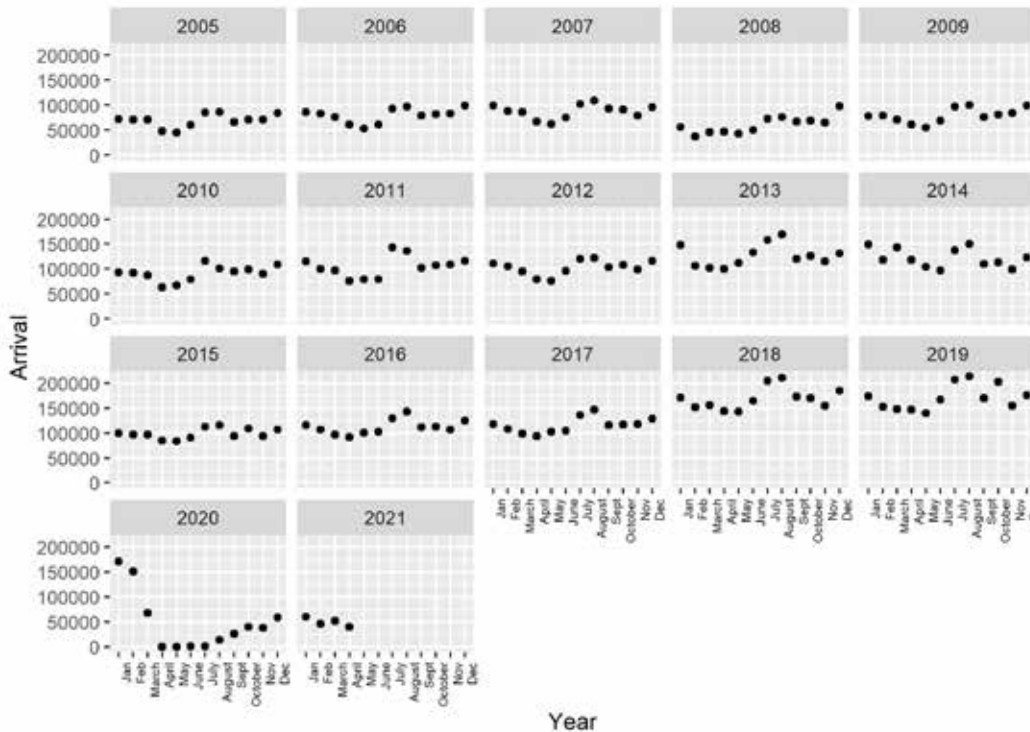
Figure 1.4 Trends per year per month for the period 2005-2021

1.2.2 TOURISM EXPENDITURE

International Tourism Expenditure

Table 1.2 presents international tourism receipts amounting to Kshs.296 billion for the year 2019. Most of the receipts are realized from accommodation (Kshs.118 billion), air passenger transport (kshs.68 billion) and Food and Beverage (Kshs.38 billion).

Table 1.2: Inbound Tourism Direct Earnings for 2019 (Kshs. '000)

PRODUCTS	Tourists (overnight visitors)	Excursionists (same-day visitors)	Visitors
Accommodation services for visitors	117,880,170		117,880,170
Food- and beverage-serving services	38,258,595	306,896	38,565,491
Railway passenger transport services	1,872,051		1,872,051
Road passenger transport services	17,819,906	464,702	18,284,607
Water passenger transport services	217,863		217,863
Air passenger transport services	68,115,761	709,803	68,825,565
Transport equipment rental services	4,833,372		4,833,372
Travel agencies and other reservation services	2,317,906	3,640	2,321,547
Cultural services	827,811		827,811
Sports and recreational services	7,165,150	785	7,165,935
Valuables	694,994	-	694,994
Other expenditure	33,758,962	990,732	34,749,693
Total	**293,762,539**	**2,476,558**	**296,239,097**

Source: Kenya TSA (2019)

Domestic Tourism Expenditure

Table 1.3 presents domestic tourism receipts amounting to Kshs.343 billion for the year 2019. Most of the receipts were realized from road transport services (Kshs.147 billion).

Table 1.3: Domestic Tourism Direct Earnings for 2019 (Kshs. '000)

PRODUCTS	Tourists (overnight visitors)
Accommodation services for visitors	20,324,719
Food and beverage-serving services	34,395,679
Railway passenger transport services	593,134
Road passenger transport services	146,963,355
Water passenger transport services	-

PRODUCTS	Tourists (overnight visitors)
Air passenger transport services	9,832,224
Transport equipment rental services	690,482
Travel agencies and other reservation services	31,268,799
Cultural services	4,690,320
Sports and recreational services	6,253,760
Valuables	65,264,125
Other expenses	23,023,428
Total	**343,300,024.06**

Source: Kenya TSA (2019)

1.3 SPECIFIC CONSEQUENCES OF COVID19 EFFECTS

1.3.1 NUMBER OF VISITOR-DAYS STAYED BY PURPOSE OF VISIT

The total visitor-days stayed reduced significantly from 19,936.9 thousand in 2019 to 4,663.2 thousand in 2020. The number of visitor-days stayed for those on holiday contracted by 87.4 per cent to 2,023.0 thousand while visitor days for those on business reduced by 26.7 per cent to 2,565.9 thousand. The average length of stay for all visitors shortened from 12.1 days in 2019 to 9.0 days in 2020 (Economic Survey 2021).

1.3.2 HOTEL OCCUPANCIES

Hotel bed occupancy was highest in February at 28.2 per cent for the year 2020. There was a high decline in hotel bed occupancy from March 2020 compared to the corresponding period in 2019. The decline was at its lowest during the month of July 2020 at 8.4%. This was mainly due to the measures put in place to curb the spread of COVID-19 (Economic Survey 2021).

1.3.2 VISITING NATIONAL PARKS AND RESERVES

The number of visitors to national parks and game reserves contracted by 65.1 per cent to 1,037.0 thousand in 2020 as compared to 2019. All national parks and game reserves registered a decline in the number of visitors due to measures put in place to curb the spread of the virus (Economic Survey 2021).

1.3.3 CONFERENCE TOURISM

The number of delegates attending international conferences dropped from 72,011 in 2019 to 1,044 in 2020. The number of delegates attending local conferences decreased by 88.5 per cent to 80,139 in 2020. Conference capacity utilization declined from 12.6 per cent in 2019 to 5.2 per cent in 2020 (Economic Survey 2021).

1.3.3 VISITORS TO SELECTED MUSEUMS, SNAKE PARKS AND HISTORICAL SITES

The number of visitors to museums, snake parks and historical sites declined significantly by 83.8 per cent from 990.2 thousand in 2019 to 160.7 thousand in 2020 (Economic Survey 2021).

1.4 COVID-19 AND TOURISM INTERVENTION STRATEGIES

Covid-19 intervention strategies for recovery have been documented by Kenya's Ministry of Tourism and Wildlife *(https://www.tourism.go.ke/wp-content/uploads/2020/07/COVID-19-and-Travel-and-Tourism-Final-1.pdf)*. Such strategies for recovery include financial measures, strategic marketing, product improvement and diversification, enhanced accessibility, price revisions, specific research, crisis preparedness and partnerships. Redesigning of domestic tourism *(https://www.tourism.go.ke/wp-content/uploads/2020/07/Domestic-Tourism-Recovery-Strategy-Final.pdf)* and digitization of travel and tourism *(https://www.tourism.go.ke/wp-content/uploads/2020/07/Digitizing-Tourism-in-Kenya-Recovery-Strategy-Final-2.pdf)* were highly recommended.

The current study estimates and quantifies the effects of Covid-19 on Kenya's tourism industry and the resultant impacts on the country's economy.
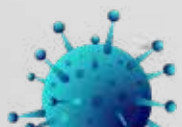
2. DIRECT EFFECT OF COVID-19 ON KENYA'S TOURISM

2.0 INTRODUCTION

The objective of this section is to estimate the direct effects of tourism in terms of output, employment generation, labour income earning and total value generation. Direct effects of changes in inbound and domestic tourism expenditure as a result of Covid-19 or other shocks exclude indirect and induced effects. These effects are the initial impacts on the economy.

Visitors directly spend on accommodation, food/drinks, transport, reservation services (for instance, tour agencies and operations) and attractions (mainly, nature and culture-based). Tourism commodity producers receive revenue as a result of this expenditure (direct effects). The revenue helps in covering costs such as wages/salaries (labour), rent (land) and interest (capital).

2.1 ACTUAL AND PROJECTED INBOUND TOURISM EXPENDITURE

Mean expenditure recorded by Kenya TSA 2019 for inbound visitors was adjusted upwards to capture price changes. Mean expenditure of Kshs. 163,884 and Kshs. 172,078 was applied for the years 2020 and 2021 respectively (Tables 2.1A and 2.1B).

Table 2.1A: Actual Versus Projected Expenditure by Inbound Visitors (2020

	SCENARIO 1		SCENARIO 2	
	Actual Arrivals (2020)	**Total Actual Expenditure With Covid-19 Effects (Kshs. Million)**	**Projected Arrivals[1]**	**Total Projected Expenditure Without Covid-19 Effects (Kshs. Million)**
MARCH	67,819	11,114	162,296	26,598
APRIL	27	4	155,413	25,470
MAY	137	22	154,416	25,306
JUNE	581	95	167,951	27,524
JULY	675	111	196,040	32,128
AUGUST	14,049	2,302	198,570	32,542
SEPTEMBER	26,018	4,264	162,902	26,697
OCTOBER	39,894	6,538	174,864	28,657
NOVEMBER	37,885	6,209	155,603	25,501
DECEMBER	58,922	9,656	182,685	29,939
TOTAL	**246,007**	**40,317**	**1,710,740**	**280,363**

Source: Actual Data from TRI

Table 2.1B: Actual Versus Projected Expenditure by Inbound Visitors (2021)

1 See ARIMA model results, Appendix 5

	SCENARIO 1		SCENARIO 2	
	Actual Arrivals (2020)	Total Actual Expenditure With Covid-19 Effects (Kshs. Million)	Projected Arrivals[2]	Total Projected Expenditure Without Covid-19 Effects (Kshs. Million)
JANUARY	59,687	10,271	205,918	35,434
FEBRUARY	45,964	7,909	186,478	32,089
MARCH	52,051	8,957	184,142	31,687
APRIL	40,183	6,915	174,779	30,076
MAY	46,142	7,940	176,843	30,431
JUNE	61,608	10,601	184,703	31,783
JULY	82,624	14,218	212,837	36,625
AUGUST	94,987	16,345	217,010	37,343
SEPTEMBER	87,991	15,141	185,328	31,891
Total	571,237	98,297	1,728,038	297,357

Source: Actual Data from TRI

2.1.1 DISTRIBUTION OF LOST EXPENDITURE

Table 2.2 shows the distribution of lost tourism eexpenditure from March 2020 to September 2021 (Kshs. 439 billion/US$ 4,084 million) among expenditure items in ratios identified by Kenya's Tourism Sattelite Account 2019 (TSA 2019).

Table 2.2: Distribution of Lost Expenditure

PRODUCTS	Kenya 2019 TSA Distribution Ratios	Loss in inbound tourism expenditure (Kshs.billion)	Loss in inbound tourism expenditure (US$ million)
Accommodation services for visitors	0.3979	174.7	1,625
Food and beverage-serving services	0.1302	57.2	532
Railway passenger transport services	0.0063	2.8	26
Road passenger transport services	0.0617	27.1	252
Water passenger transport services	0.0007	0.3	3
Air passenger transport services	0.2323	102.0	949
Transport equipment rental services	0.0163	7.2	67
Travel agencies and other reservation services	0.0078	3.4	32
Cultural services	0.0028	1.2	11
Sports and recreational services	0.0242	10.6	99
Valuables	0.0023	1.0	10
Other	0.1173	51.5	479
Total	1.0000	439.0	4,084

Source: Consultant's Computations

2 See ARIMA model results, Appendix 5

2.1.2 DIRECT EFFECTS OF REDUCED INBOUND TOURISM EXPENDITURE

Reduction in tourism expenditure for the year 2020-21 was decomposed into accommodation (Kshs 174.7 billion), food and drinks (Kshs.57.2 billion), passenger transport (Kshs.142.8 billion), attractions (Kshs.11.8 billion) and shopping etc. (Kshs.52.5 billion). These expenditure items were analysed under the economy's hotels, restaurant, food and beverage, other services, transport and retail trade sectors accordingly.

Table 2.3 summarizes direct effects of reduction in inbound visitor expenditure on various tourism characteristics products.

Table 2.3: Direct Effects of Inbound Tourism Expenditure (Kshs), 2020

TOURISM EXPENDITURE						
	Accommodation	Food & Drinks	Passenger Transport	Attractions	Shopping	Total
Employment (000)	-262	-98	-88	-12	-171	-631
Labour Income (Million)	-23,113	-8,600	-25,800	-2,903	-15,158	-75,573
Total Value Added (Million)	-64,285	-49,773	-63,748	-9,675	-31,068	-218,548
Output (Million)	-174,688	-57,190	-142,868	-11,825	-13,868	-400,438

Source: Kenya IMPLAN Model Output (Extracted from Table 4.1)

Accommodation sub-sector lost 262 thousand direct full time equivalent jobs and Kshs.23 billion as labour income, Kshs.64 billion in value addition and Kshs.175 billion as output due to Kshs.174.7 billion reductions in inbound tourism spending (Table 3.1).

Food and Beverage sub-sector lost 98 thousand direct full time equivalent jobs and Kshs.9 billion as labour income, Kshs.50 billion in value addition and Kshs.57 billion as output due to Kshs.57.2 billion reductions in inbound tourism spending.

Transport sub-sector lost 88 thousand direct full time equivalent jobs and Kshs.26 billion as labour income, Kshs.64 billion in value addition and Kshs.143 billion as output due to Kshs.142.8 billion reductions in inbound tourism spending.

Attractions sub-sector lost approximately 12 thousand direct full time equivalent jobs and Kshs.3 billion as labour income, Kshs.10 billion in value addition and Kshs.12 billion as output due to Kshs.11.8 billion reductions in inbound tourism spending.

Shopping and other related activities sub-sector lost approximately 171 thousand direct full time equivalent jobs and Kshs.15 billion as labour income, Kshs.31 billion in value addition and Kshs.14 billion as output due to Kshs.52.5 billion reductions in inbound tourism spending.

Overall, the tourism sector lost 631 thousand direct full time equivalent jobs and Kshs.76 billion as labour income, Kshs.219 billion in value addition and Kshs.400 billion as output due to general reduction in inbound tourism spending of almost Kshs.439 billion.

2.2 DOMESTIC TOURISM

2.2.1 INTRODUCTION

Domestic tourism comprises activities of residents travelling to and staying at least over a night in places outside their usual environment within the country, for not more than 12 months, for leisure, business or other purposes. The Kenya Integrated Household Budget Survey (KIHBS,

2016) included a module on domestic tourism. The results of the survey showed that at national level, 13.4 per cent of individuals travelled within the country over 3 months preceding the survey. Slightly over 42.7% of those who engaged in domestic tourism were in the 18-35 years' age group. Almost 47.9% of those who participated were from urban areas.

Among those who participated, around 79.8 per cent took one trip in the three months preceding the survey. Over 71.3% of those who travelled within urban areas were visiting friends and relatives while 7.6% were engaged in social gatherings. At national level, transport accounted for the largest share (38.4%) of expenditure on domestic tourism followed by shopping for personal use (12.9%) and gifts or presents (11.5%).

2.2.2 DOMESTIC TOURISM EXPENDITURE

According to Kenya TSA, 13.6% of Kenyans took part in domestic travel in 2019, the same was applied to 2020 and 2021 estimated population. Price changes and real income growth rate between 2019, 2020 and 2021 were taken into account when forecasting domestic tourism expenditure without Covid-19 effects. Kenya TSA estimated domestic tourism expenditure of Kshs. 343 billion (2019) was adjusted upwards to Kshs. 370 billion (Scenario 1 for 2020) and Kshs 389 billion (Scenario 1 for 2021). Globally, Covid-19 negative impact on domestic tourism expenditure was estimated to be in the range of 60% to 70% over 2020 and 40% to 50% over 2021. Workings yielded Kshs 259 billion and Kshs 117 billion as lost earnings for the year 2020 and the first three quarters of 2021 respectively (Table 2.4).

Table 2.4: Decomposition of Lost Domestic Tourism Expenditure

PRODUCTS	Kenya 2019 TSA Distribution Ratios	Loss in inbound tourism expenditure (Kshs.billion)	Loss in inbound tourism expenditure (US$ million)
Accommodation services for visitors	0.0592	22.3	207
Food and beverage-serving services	0.1002	37.7	350
Railway passenger transport services	0.0017	0.6	6
Road passenger transport services	0.4281	161.0	1,497
Water passenger transport services			
Air passenger transport services	0.0286	10.8	100
Transport equipment rental services	0.0020	0.8	7
Travel agencies and other reservation services	0.0911	34.2	319
Cultural services	0.0137	5.1	48
Sports and recreational services	0.0182	6.8	64
Valuables	0.1901	71.5	665
Other	0.0671	25.2	235
Total	**1.0000**	**376.0**	**3,498**

Source: Consultant's Computations

2.2.3 EFFECTS OF REDUCED DOMESTIC TOURISM EXPENDITURE

Reduction in domestic tourism expenditure for the year 2020 was decomposed into accommodation (Kshs.22.3billion), food and drinks (Kshs.37.7 billion), passenger transport (Kshs.207.4 billion), attractions (Kshs.11.9 billion) and shopping plus related activities (Kshs.96.7 billion). These expenditure items were analysed under the economy's hotels, restaurant, food and beverage, other services sectors accordingly.

Table 2.5 summarizes direct effects of reduction in domestic tourism expenditure on various tourism characteristics products.

Table 2.5: Direct Effects of Domestic Tourism Expenditure (Kshs.), 2020-21

TOURISM EXPENDITURE						
	Accommodation	Food & Drinks	Passenger Transport	Attractions	Shopping	Total
Employment (000)	-33	-64	-128	-12	-315	-552
Labour Income (Million)	-2,903	-5,698	-37,410	-3,010	-27,843	-76,863
Total Value Added (Million)	-8,170	-32,788	-92,450	-9,783	-57,190	-200,380
Output (Million)	-22,253	-37,625	-207,368	-12,040	-96,750	-376,035

Source: Kenya IMPLAN Model Output (Extracted from Table 4.2)

Accommodation sub-sector lost 33 thousand direct full time equivalent jobs and Kshs.3 billion as labour income, Kshs.8 billion in value addition and Kshs.22 billion as output due to Kshs.22.3 billion reductions in domestic tourism spending (Table 3.2).

Food and Beverage sub-sector lost 64 thousand direct full time equivalent jobs and Kshs.6 billion as labour income, Kshs.33 billion in value addition and Kshs.38 billion as output due to Kshs.37.7 billion reductions in tourism spending.

Transport sub-sector lost 128 thousand direct full time equivalent jobs and Kshs.37 billion as labour income, Kshs.92 billion in value addition and Kshs.207 billion as output due to Kshs.207.4 billion reductions in tourism spending.

Attractions sub-sector lost approximately 12 thousand direct full time equivalent jobs and Kshs.3 billion as labour income, Kshs.10 billion in value addition and Kshs.12 billion as output due to Kshs.11.9 billion reductions in tourism spending.

Shopping and other related activities sub-sector lost approximately 315 thousand direct full time equivalent jobs and Kshs.28 billion as labour income, Kshs.57 billion in value addition and Kshs.98 billion as output due to Kshs.96.7 billion reductions in tourism spending.

Overall, the tourism sector lost 552 thousand direct full time equivalent jobs and Kshs.77 billion as labour income, Kshs.200 billion in value addition and Kshs.376 billion as output due to general reduction in domestic tourism spending of about Kshs.376 billion.

2.3 SUMMARY

Table 2.6 provides direct losses arising from combined reduction in domestic and inbound tourism expenditure (i.e. internal tourism expenditure).

Table 2.6: Direct Effect of Losses in Internal Tourism Expenditure (Kshs.), 2020

TOURISM EXPENDITURE						
	Accommodation	Food & Drinks	Passenger Transport	Attractions	Shopping	Total
Employment (000)	-295	-162	-216	-24	-486	-1,183
Labour Income (Million)	-26,015	-14,298	-63,210	-5,913	-43,000	-152,435
Total Value Added (Million)	-72,455	-82,560	-156,198	-19,458	-88,258	-418,928
Output (Million)	-196,940	-94,815	-350,235	-23,865	-110,618	-776,473

Source: Kenya IMPLAN Model Output

Impact on accommodation sub-sector is estimated to have cost the country 295 thousand full time equivalent jobs and Kshs26 billion in labour income, Kshs73 billion in value addition and Kshs197 billion as output due to Kshs197 billion reductions in internal (inbound and domestic) tourism consumption as a result of Covid-19 effects.

Effects on food and beverage (F&B) sub-sector cost the country about 162 thousand jobs, Kshs14 billion in labour income, Kshs83 billion in value addition and Kshs95 billion as output due to Kshs94.9 billion losses in earnings from internal tourism consumption.

Almost Kshs350.2 billion worth of expected passenger transport earnings from internal tourism expenditure was not realized. This led to an estimated loss of 216 thousand jobs, Kshs63 billion labour income, Kshs156 billion value added and Kshs350 billion worth of output throughout the economy.

Recreation and other attractions facilities remained idle for most of the year due to Covid-19 protocols resulting in Kshs23.7 billion losses in earnings from internal tourism consumption. Almost 24,000 jobs were lost and consequently Kshs6 billion labour income, Kshs19 billion value added and Kshs24 billion worth of output across the country's economy.

Reduced expenditure of about Kshs149.2 billion in shopping and related activities sub-sector resulted in losses of nearly 486 thousand jobs, Kshs43 billion in labour income, Kshs88 billion in value addition and Kshs111 billion as output.

Overall, Kenya's economy lost 1.2 million full time equivalent jobs, Kshs152 billion in labour income, Kshs419 billion in value addition and Kshs776 billion in output as a result of Kshs815 billion losses in direct earnings from both international and domestic tourism.

3. TOTAL IMPACT ON THE ECONOMY DUE TO EFFECTS OF COVID-19 ON KENYA'S TOURISM

3.1 INTRODUCTION

The objective of this section is to estimate the impacts of tourism in terms of output, employment generation, labour income earning and total value generation. The strength of tourism inter-industry linkages will also be assessed.

3.2 METHODOLOGY

The economic impacts of tourism can be estimated using economic models that identify and quantify the linkages between different sectors of the economy. The relationship between expenditure and output, and income and employment (direct, indirect and induced) can be described by multipliers. Tourism industry is related with several other industries in the economy. Both tourism demand and supply forces create primary (direct) and secondary (indirect and induced) economic effects. The standard approach is to estimate the economic impacts of tourism by using Input-Output models (1-0), Social Accounting Matrix (SAM) and/or Computable General Equilibrium (CGE) models. Input-Output and Social Accounting Matrix (SAM) models are adopted in analysing the resultant impacts of COVID19 (Appendix 1).

3.3 ANALYSIS

Two inputs are required to assess economic impacts of tourism expenditure; a set of multipliers corresponding to tourism specific industries and a measure of tourism demand changes appropriately disaggregated and matched with corresponding industries. These inputs were obtained from the following data sources:

3.3.1 KENYA'S INPUT-OUTPUT TABLE

The study relies on Kenya I-O table available at http://www.worldmrio.com/country/ that contains multi-region I-O tables (MRIO) for 190 countries including Kenya.

3.3.2 KENYA'S SOCIAL ACCOUNTING MATRIX (SAM)

SAM captures an economy's expenditure and income linkages and is derived by modifying the appropriate I-O table. Input-Output table, public sector accounts, national income accounts and balance of payments are used to construct SAM. SAM methodology focuses on induced effects besides the direct and indirect ones, giving it some advantages over the I-O modelling methodology.

3.3.3 IMPLAN SOFTWARE PACKAGE

IMPLAN Software package (https://implan.com), frequently used for tourism impact studies, was adopted for current analysis.

3.4 MULTIPLIERS

Visitors directly spend on accommodation, food/drinks, transport, reservation services (for instance, tour agencies and operations) and attractions (mainly, nature and culture-based). Tourism commodity producers receive revenue as a result of this expenditure (direct effects). The revenue helps in covering costs such as wages/salaries (labour), rent (land), interest (capital) and profits (enterprise). In addition, tourism commodity producers purchase inputs from other sectors in the economy in order to meet the demand by tourists (indirect effects). Tourism wage earners spend their income on goods and services produced, to a large extent, within the economy (creating induced effects). Total effects, resulting from multiplier operations, can be decomposed into direct, indirect and induced components.

There are several different multiplier impacts depending on the secondary effects included and the measure of economic activity used. Common multipliers used refer to output, income, value added and employment. Appendix 2 presents direct, indirect, induced and total employment, labour income, value added and output multipliers for Kenya's tourism related sectors.

The next section gives the effects of reduced expenditure by visitors (inbound and domestic).

3.5 TOTAL IMPACT DUE TO LOSSES FROM INBOUND TOURISM

Reduction in tourism expenditure for the year 2020-21 was decomposed into accommodation (Kshs.174.7 billion), food and drinks (Kshs.57.2 billion), passenger transport (Kshs.142.8 billion), attractions (Kshs.11.8 billion) and shopping and related activities (Kshs.52.5 billion). These expenditure items were analysed under the economy's hotels, restaurant, food and beverage, transport, other services and trade sectors accordingly (Appendix 3).

Table 3.1 summarizes effects of reduction in inbound visitor expenditure on various tourism characteristics products based on the derived multipliers.

Table 3.1: Total Impacts of Inbound Tourism Expenditure (Kshs.), 2020-21

TOURISM EXPENDITURE						
	Accommodation	Food & Drinks	Passenger Transport	Attractions	Shopping	Total
EMPLOYMENT (000)						
Direct	-262	-98	-88	-12	-171	-631
Indirect	-244	-13	-164	-3	-7	-431
Induced	-198	-40	-192	-13	-63	-506
Total	-704	-151	-444	-27	-242	-1,568

LABOUR INCOME (MILLION)						
Direct	-23,113	-8,600	-25,800	-2,903	-15,158	-75,573
Indirect	-46,440	-2,580	-30,100	-1,075	-2,473	-82,668
Induced	-21,823	-4,408	-21,070	-1,398	-6,880	-55,578
Total	-91,375	-15,588	-76,970	-5,375	-24,510	-213,818

TOTAL VALUE ADDED (MILLION)						
Direct	-64,285	-49,773	-63,748	-9,675	-31,068	-218,548
Indirect	-99,545	-6,450	-72,885	-2,150	-5,590	-186,620
Induced	-54,395	-10,965	-52,675	-3,548	-17,308	-138,890
Total	-218,225	-67,295	-189,200	-15,265	-53,965	-543,950

OUTPUT (MILLION)						

	Accommodation	Food & Drinks	Passenger Transport	Attractions	Shopping	Total
DIRECT	-174,688	-57,190	-142,868	-11,825	-13,975	-400,545
INDIRECT	-141,578	-9,460	-118,250	-3,118	-8,385	-280,790
INDUCED	-78,690	-15,910	-76,218	-5,160	-24,940	-200,918
TOTAL	-394,955	-82,560	-337,335	-20,103	-47,300	-882,253

Source: Kenya IMPLAN Model Output

3.5.1 REDUCTION IN ACCOMMODATION EXPENDITURE (2020-21)

Accommodation is estimated to have lost 704 thousand full time equivalent jobs and Kshs.91 billion as labour income, Kshs.218 billion in value addition and Kshs.395 billion as output due to Kshs.174.7 billion reductions in tourism spending (Table 3.1).

3.5.2 FOOD AND BEVERAGE (F&B)

Food and Beverage sub-sector is estimated to have lost 151 thousand full time equivalent jobs and Kshs.16 billion as labour income, Kshs.67 billion in value addition and Kshs.83 billion as output due to Kshs.57.2 billion reductions in tourism spending (Table 3.1).

3.5.3 TRANSPORT

Transport sub-sector is estimated to have lost 444 thousand full time equivalent jobs and Kshs.77 billion as labour income, Kshs.189 billion in value addition and Kshs.337 billion as output due to Kshs.142.8 billion reductions in tourism spending (Table 3.1).

3.5.4 ATTRACTIONS

Attractions sub-sector lost approximately 27,000 full time equivalent jobs and Kshs.5 billion as labour income, Kshs.15 billion in value addition and Kshs.20 billion as output due to Kshs.11.8 billion reductions in tourism spending (Table 3.1).

3.5.5 SHOPPING AND RELATED ACTIVITIES

Shopping and related activities sub-sector lost approximately 242,000 full time equivalent jobs and Kshs.25 billion as labour income, Kshs.54 billion in value addition and Kshs.47 billion as output due to Kshs.52.5 billion reductions in tourism spending (Table 3.1).

Overall, the economy is estimated to have lost 1.6 million total full time equivalent jobs and Kshs.214 billion as labour income, Kshs.544 billion in value addition and Kshs.882 billion as output due to general reduction in inbound tourism spending of about Kshs. 439 billion.

3.6 TOTAL IMPACT DUE TO LOSSES FROM DOMESTIC TOURISM

Reduction in domestic tourism expenditure for the year 2020-21 was decomposed into accommodation (Kshs.22.3 billion), food and drinks (Kshs.37.7 billion), passenger transport (Kshs.207.4 billion), attractions (Kshs.11.9 billion) and shopping plus related activities (Kshs.96.7 billion). These expenditure items were analysed under the economy's hotels, restaurant, food and beverage, transport, other services and trade sub-sectors accordingly (Appendix 4).

Table 3.2 summarizes effects of reduction in domestic visitor expenditure on various tourism characteristics products based on the derived multipliers.

Table 3.2: Impacts of Domestic Tourism Expenditure (Kshs), 2020-21

TOURISM EXPENDITURE						
	Accommodation	**Food & Drinks**	**Passenger Transport**	**Attractions**	**Shopping**	**Total**
EMPLOYMENT (000)						
Direct	-33	-64	-128	-12	-315	-552
Indirect	-31	-9	-238	-3	-51	-332
Induced	-25	-26	-279	-13	-146	-489
Total	-90	-99	-644	-28	-513	-1,374
LABOUR INCOME (MILLION)						
Direct	-2,903	-5,698	-37,410	-3,010	-27,843	-76,863
Indirect	-5,913	-1,720	-43,753	-1,075	-17,093	-69,553
Induced	-2,795	-2,903	-30,638	-1,398	-16,125	-53,858
Total	-11,610	-10,320	-111,800	-5,483	-61,060	-200,273
TOTAL VALUE ADDED (MILLION)						
Direct	-8,170	-32,788	-92,450	-9,783	-57,190	-200,380
Indirect	-12,685	-4,300	-105,673	-2,150	-39,023	-163,830
Induced	-6,880	-7,203	-76,433	-3,548	-40,205	-134,268
Total	-27,843	-44,290	-274,663	-15,588	-136,418	-498,800
OUTPUT (MILLION)						
DIRECT	-22,253	-37,625	-207,368	-12,040	-96,750	-376,035
INDIRECT	-18,060	-6,235	-171,570	-3,225	-58,480	-257,570
INDUCED	-9,998	-10,428	-110,618	-5,160	-58,158	-194,360
TOTAL	-50,310	-54,288	-489,555	-20,425	-213,388	-827,965

Source: Kenya IMPLAN Model Output

3.6.1 REDUCTION IN ACCOMMODATION EXPENDITURE

Accommodation is estimated to have lost 90 thousand full time equivalent jobs and Kshs.12 billion as labour income, Kshs.28 billion in value addition and Kshs.50 billion as output due to Kshs.22.3 billion reductions in domestic tourism spending (Table 3.2).

3.6.2 FOOD AND BEVERAGE (F&B)

Food and Beverage sub-sector is estimated to have lost 99 thousand full time equivalent jobs and Kshs.10 billion as labour income, Kshs.44 billion in value addition and Kshs.54 billion as output due to Kshs.37.7 billion reductions in tourism spending (Table 3.2).

3.6.3 TRANSPORT

Transport sub-sector is estimated to have lost 644 thousand full time equivalent jobs and Kshs.112 billion as labour income, Kshs.275 billion in value addition and Kshs.490 billion as output due to Kshs.207.4 billion reductions in tourism spending (Table 3.2).

3.6.4 ATTRACTIONS

Attractions sub-sector lost approximately 28 thousand full time equivalent jobs and Kshs.5 billion as labour income, Kshs.16 billion in value addition and Kshs.20 billion as output due to Kshs.11.9 billion reductions in tourism spending (Table 3.2).

3.6.5 SHOPPING AND RELATED ACTIVITIES

Shopping and related activities sub-sector lost approximately 513 thousand full time equivalent jobs and Kshs.61 billion as labour income, Kshs.136 billion in value addition and Kshs.213 billion as output due to Kshs.96.7 billion reductions in tourism spending (Table 3.2).

Overall, the economy is estimated to have lost 1.4 million full time equivalent jobs and Kshs.200 billion as labour income, Kshs.499 billion in value addition and Kshs.828 billion as output due to general reduction in domestic tourism spending of almost Kshs.376 billion.

4. CONCLUSION

Due to the COVID-19 pandemic, both international(inbound) and domestic tourism faced near collapse. Given the tourism sector's strong linkages with the wider economy, reduced tourist arrivals impeded consumption of various goods and services and reduced incomes of workers in related sectors.

This study set out to estimate the impacts of tourism by computing multipliers using inter-industry transaction tables for Kenya. Internal tourism expenditure covers both inbound and domestic tourism spending (Table 5.1).

Table 5.1: Total Impact of Losses in Internal Tourism Expenditure (Kshs), 2020-21

TOURISM EXPENDITURE						
	Accommodation	Food & Drinks	Passenger Transport	Attractions	Shopping	Total
EMPLOYMENT (000)						
Direct	-295	-162	-216	-24	-486	-1,183
Indirect	-275	-22	-402	-6	-58	-763
Induced	-223	-66	-471	-26	-209	-995
Total	-794	-250	-1,088	-55	-755	-2,942

LABOUR INCOME (MILLION)						
Direct	-26,015	-14,298	-63,210	-5,913	-43,000	-152,435
Indirect	-52,353	-4,300	-73,853	-2,150	-19,565	-152,220
Induced	-24,618	-7,310	-51,708	-2,795	-23,005	-109,435
Total	-102,985	-25,908	-188,770	-10,858	-85,570	-414,090

TOTAL VALUE ADDED (MILLION)						
Direct	-72,455	-82,560	-156,198	-19,458	-88,258	-418,928
Indirect	-112,230	-10,750	-178,558	-4,300	-44,613	-350,450
Induced	-61,275	-18,168	-129,108	-7,095	-57,513	-273,158
Total	-246,068	-111,585	-463,863	-30,853	-190,383	-1,042,750

	Accommodation	Food & Drinks	Passenger Transport	Attractions	Shopping	Total
OUTPUT (MILLION)						
DIRECT	-196,940	-94,815	-350,235	-23,865	-110,725	-776,580
INDIRECT	-159,638	-15,695	-289,820	-6,343	-66,865	-538,360
INDUCED	-88,688	-26,338	-186,835	-10,320	-83,098	-395,278
TOTAL	-445,265	-136,848	-826,890	-40,528	-260,688	-1,710,218

Source: Kenya IMPLAN Model Output

Impact on accommodation sub-sector is estimated to have cost the country 794 thousand full time equivalent jobs and Kshs103 billion in labour income, Kshs246 billion in value addition and Kshs445 billion as output due to Kshs197 billion reductions in internal (inbound and domestic) tourism consumption as a result of Covid-19 effects.

Effects on food and beverage (F&B) sub-sector cost the country about 250 thousand jobs, Kshs26 billion in labour income, Kshs112 billion in value addition and Kshs137 billion as output due to Kshs94.9 billion losses in earnings from internal tourism consumption.

Almost Kshs350.2 billion worth of expected passenger transport earnings from internal tourism expenditure was not realized. This led to an estimated loss of 1.1 million jobs, Kshs189 billion labour income, Kshs464 billion value added and Kshs827 billion worth of output throughout the economy.

Recreation and other attractions facilities remained idle for most of the year due to Covid-19 protocols resulting in Kshs23.7 billion losses in earnings from internal tourism consumption. Almost 55,000 jobs were lost and consequently Kshs11 billion labour income, Kshs31 billion value added and Kshs41 billion worth of output across the country's economy.

Overall, Kenya's economy lost 2.9 full time equivalent jobs, Kshs414 billion in labour income, Kshs1.0 trillion in value addition and Kshs1.7 trillion in output as a result of Kshs815 billion losses in earnings from both international and domestic tourism.

WAY FORWARD

Documented intervention strategies for recovery should be pursued and their positive and negative impacts monitored with a view to informing policy. Results show that, due to its strong linkages with other service sectors inter alia, tourism has the potential to anchor the service sector's role in the country's economic growth. Interventions to grow internal tourism demand such as increasing tourism expenditure will, as a result of indirect and induced effects, create higher value addition and greater labour income and output. Future studies can re-estimate these impacts by using more robust methodologies such as computable general equilibrium (CGE) model.

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6. APPENDICES

APPENDIX 1: IMPLAN MODEL OVERVIEW

IMPLAN Model 4 TRI	Copyright 2021 Minnesota IMPLAN Group, Inc.		
Model Information			
Model Year	2015	**Value Added**	
GRP	$52,410,600,801	Employee Compensation	$18,762,723,136
Total Personal Income	$27,271,400,000	Proprietor Income	$4,582,668,457
Total Employment	18,839,231	Other Property Type Income	$28,884,176,580
		Tax on Production and Import	$181,032,628
Number of Industries	52		
Land Area (Sq. Miles)	224,081	Total Value Added	$52,410,600,801
Area Count	1		
		Final Demand	
Population	47,878,340	Households	36,880,143,423
Total Households	8,752,895	State/Local Government	$
Average Household Income	$3,116	Federal Government	$6,913,037,170
		Capital	$7,918,995,148
Trade Flows Method	Supply/Demand Pooling	Exports	$7,698,578,428
Model Status	Multipliers	Imports	-$6,541,663,679
		Institutional Sales	-$458,489,788
Economic Indicators			
Shannon-Weaver Index	.8228	Total Final Demand:	$52,410,600,702

Source: Kenya IMPLAN Model

APPENDIX 2: DIRECT, INDIRECT AND INDUCED TOURISM INDUSTRY MULTIPLIERS

IMPACT					
Sector	**Effect Accommodation**	**Output**	**Labour Income**	**Employment**	**Value Added**
HOTEL	Direct Effect	1	0.13	165.51	0.37
	Indirect Effect	0.84	0.27	153.79	0.60
	Induced Effects	0.47	0.12	125.18	0.31
	Total	2.31	0.52	444.48	1.25

Sector	Effect Accommodation	Output	Labour Income	Employment	Value Added
Restaurant	Direct Effect	1	0.15	189.36	0.87
	Indirect Effect	0.17	0.05	25.18	0.11
	Induced Effects	0.29	0.08	77.70	0.19
	Total	1.46	0.27	292.25	1.18
Transport	Direct Effect	1	0.18	66.28	0.43
	Indirect Effect	0.84	0.21	123.45	0.50
	Induced Effects	0.54	0.14	144.56	0.36
	Total	2.38	0.53	334.29	1.29
Tour Operations & Travel Agency	Direct Effect				
	Indirect Effect				
	Induced Effect				
	Total	1.85	0.48	237.25	1.31
Trade	Direct Effect	1	0.28	344.52	0.57
	Indirect Effect	0.60	0.17	55.30	0.39
	Induced Effects	0.60	0.16	159.97	0.40
	Total	2.19	0.60	559.78	1.35

Source: Kenya IMPLAN Model

APPENDIX 3: IMPACTS OF INBOUND TOURISM

3.1 ACCOMMODATION SUB-SECTOR

Impact Summary	IMPLAN Model 1 TRI COVID19 IMPACT 20thOCT21.impdb	Copyright 2021 Minnesota IMPLAN Group, Inc.		
Impact Type	**Employment**	**Labor Income**	**Total Value Added**	**Output**
Direct Effect	-262,144	-215,315,976	-598,226,014	-1,625,000,059
Indirect Effect	-243,587	-432,196,122	-926,080,951	-1,317,114,474
Induced Effect	-198,276	-202,685,956	-506,021,512	-732,038,857
Total Effect	**-704,007**	**-850,198,055**	**-2,030,328,477**	**-3,674,153,389**

Source: Kenya IMPLAN Model Output

3.2 FOOD AND BEVERAGE SUB-SECTOR

Impact Summary	IMPLAN Model 1 TRI COVID19 IMPACT 20thOCT21.impdb	Copyright 2021 Minnesota IMPLAN Group, Inc.		
Impact Type	Employment	Labor Income	Total Value Added	Output
Direct Effect	-97,729	-80,271,440	-463,441,687	-532,000,030
Indirect Effect	-12,995	-24,029,149	-60,468,358	-87,798,853
Induced Effect	-40,101	-40,993,485	-102,343,476	-148,055,763
Total Effect	**-150,826**	**-145,294,074**	**-626,253,521**	**-767,854,646**

Source: Kenya IMPLAN Model Output

3.3   TRANSPORT SUB-SECTOR

Impact Summary	IMPLAN Model 1 TRI COVID19 IMPACT 20thOCT21.impdb	Copyright 2021 Minnesota IMPLAN Group, Inc.		
Impact Type	Employment	Labor Income	Total Value Added	Output
Direct Effect	-88,001	-239,596,870	-592,695,869	-1,328,999,941
Indirect Effect	-163,913	-280,459,788	-677,554,003	-1,099,908,905
Induced Effect	-191,950	-196,219,175	-489,876,680	-708,682,845
Total Effect	**-443,864**	**-716,275,833**	**-1,760,126,552**	**-3,137,591,691**

Source: Kenya IMPLAN Model Output

3.4   ATTRACTIONS SUB-SECTOR

Impact Summary	IMPLAN Model 1 TRI COVID19 IMPACT 20thOCT21.impdb	Copyright 2021 Minnesota IMPLAN Group, Inc.		
Impact Type	Employment	Labor Income	Total Value Added	Output
Direct Effect	-11,620	-27,173,692	-89,561,879	-110,000,003
Indirect Effect	-2,586	-9,732,143	-19,756,900	-29,165,675
Induced Effect	-12,890	-13,176,765	-32,896,835	-47,590,390
Total Effect	**-27,096**	**-50,082,599**	**-142,215,613**	**-186,756,068**

Source: Kenya IMPLAN Model Output

3.5 SHOPPING

Impact Summary	IMPLAN Model 1 TRI COVID19 IMPACT 20thOCT21.impdb	Copyright 2021 Minnesota IMPLAN Group, Inc.		
Impact Type	Employment	Labor Income	Total Value Added	Output
Direct Effect	-171,401	-140,783,283	-289,239,081	-129,838,887
Indirect Effect	-7,305	-22,937,993	-52,328,050	-78,473,611
Induced Effect	-62,840	-64,237,745	-160,374,608	-232,006,825
Total Effect	**-241,546**	**-227,959,021**	**-501,941,739**	**-440,319,323**

Source: Kenya IMPLAN Model Output

APPENDIX 4: IMPACTS OF DOMESTIC TOURISM

4.1   ACCOMMODATION SUB-SECTOR

Impact Summary	IMPLAN Model 1 TRI COVID19 IMPACT 20thOCT21.impdb	Copyright 2021 Minnesota IMPLAN Group, Inc.		
Impact Type	Employment	Labor Income	Total Value Added	Output
Direct Effect	-33,393	-27,427,943	-76,204,791	-207,000,007
Indirect Effect	-31,029	-55,055,137	-117,968,466	-167,780,121
Induced Effect	-25,257	-25,819,073	-64,459,356	-93,250,488
Total Effect	**-89,680**	**-108,302,152**	**-258,632,612**	**-468,030,616**

Source: Kenya IMPLAN Model Output

4.2   FOOD AND BEVERAGE SUB-SECTOR

Impact Summary	IMPLAN Model 1 TRI COVID19 IMPACT 20thOCT21.impdb	Copyright 2021 Minnesota IMPLAN Group, Inc.		
Impact Type	Employment	Labor Income	Total Value Added	Output
Direct Effect	-64,296	-52,810,158	-304,895,846	-350,000,020
Indirect Effect	-8,550	-15,808,651	-39,781,815	-57,762,403
Induced Effect	-26,383	-26,969,398	-67,331,234	-97,405,107
Total Effect	**-99,228**	**-95,588,206**	**-412,008,895**	**-505,167,530**

Source: Kenya IMPLAN Model Output

4.3   TRANSPORT SUB-SECTOR

Impact Summary	IMPLAN Model 1 TRI COVID19 IMPACT 20thOCT21.impdb	Copyright 2021 Minnesota IMPLAN Group, Inc.		
Impact Type	Employment	Labor Income	Total Value Added	Output
Direct Effect	-127,731	-347,767,015	-860,278,653	-1,928,999,914
Indirect Effect	-237,914	-407,078,203	-983,447,458	-1,596,481,774
Induced Effect	-278,608	-284,805,709	-711,039,967	-1,028,629,953
Total Effect	**-644,253**	**-1,039,650,927**	**-2,554,766,079**	**-4,554,111,642**

Source: Kenya IMPLAN Model Output

4.4 ATTRACTIONS SUB-SECTOR

Impact Summary	IMPLAN Model 1 TRI COVID19 IMPACT 20thOCT21.impdb | Copyright 2021 Minnesota IMPLAN Group, Inc.			
Impact Type	**Employment**	**Labor Income**	**Total Value Added**	**Output**
Direct Effect	-11,831	-27,667,759	-91,190,277	-112,000,003
Indirect Effect	-2,633	-9,909,091	-20,116,116	-29,695,960
Induced Effect	-13,124	-13,416,342	-33,494,959	-48,455,670
Total Effect	**-27,589**	**-50,993,192**	**-144,801,352**	**-190,151,633**

Source: Kenya IMPLAN Model Output

4.4   SHOPPING

Impact Summary	IMPLAN Model 1 TRI COVID19 IMPACT 20thOCT21.impdb | Copyright 2021 Minnesota IMPLAN Group, Inc.			
Impact Type	**Employment**	**Labor Income**	**Total Value Added**	**Output**
Direct Effect	-315,463	-259,110,337	-532,341,867	-899,999,980
Indirect Effect	-50,635	-158,998,537	-362,720,638	-543,952,971
Induced Effect	-146,475	-149,733,307	-373,821,038	-540,790,299
Total Effect	**-512,573**	**-567,842,181**	**-1,268,883,543**	**-1,984,743,250**

Source: Kenya IMPLAN Model Output

APPENDIX 5: FORECASTING TOURISM DEMAND (MONTHLY ARRIVALS)

1.1 INTRODUCTION

To forecast tourism demand, researchers and scholars have employed various models. In this regard, Song and Li (2008) provide a comprehensive review indicating that forecasting methodology is very diverse since "researchers use both time series and econometric models in estimating tourism demand." The basic indicator describing tourism which is most applicable is tourist arrivals (Friscintia and Alamsyah, 2019). In this analysis, Time series approach is considered appropriate.

1.2. TIME SERIES APPROACH

Time series approach considers the internal structure of the variable with respect to its own past values and the random variation. To this end, Autoregressive Integrated Moving-Average model (ARIMA) is employed in this analysis. There are several justifications for this choice. Claveria and Torra (2014) found out that ARIMA is capable to outperform other models such as ANN and SETAR. Gunter and Onder (2015) showed that ARIMA provides reliable predictions in tourist arrivals. Li, Song and Witt (2005) concluded that ARIMA is a favorable forecasting technique in the tourism context.

1.3 ARIMA MODEL

The analysis is based on the Box–Jenkins methodology (Box & Jenkins, 1976) as a suitable technique for short-run forecasting. A general ARIMA model is ordered by $(p, d,)$ and it can be written as (Yu, Wang, Gao & Tang, 2016).

$$\emptyset(B)\, \nabla^d\, X\_t = \theta(B)\, \varepsilon\_t \qquad\qquad (1)$$

Where X_t and ε_t represent the number of tourists arrivals and random error terms at time t, respectively. B is a backward shift operator defined by $Bx_t = x_{t-1}$ and related to ∇ by $\nabla = 1 - B$; $\nabla^d = (1-B)^d$; d is the order of differencing. $\emptyset(B)$ and $\theta(B)$ are Autoregressive (AR) and Moving Averages (MA) operators of order p and, respectively, and they are defined as

$$\emptyset(B) = 1 - \emptyset_1 B - \emptyset_2 B^2 - \cdots - \emptyset_p B^2$$
$$\theta(B) = 1 - \theta_1 B - \theta_2 B^2 - \cdots - \theta_q B^q$$

$\emptyset_1, \emptyset_2, \ldots, \emptyset_p$ are the AR coefficients and $\theta_1, \theta_2, \ldots, \theta_q$ are the MA coefficients.

1.3.1 IDENTIFICATION OF THE ARIMA $(p,,)$ STRUCTURE

The series was analyzed for stationarity using the series graph and the correlogram test. The correlogram test is needed to decide whether the data has a seasonality pattern or not. The result indicates that the series is non-stationary at levels. This is shown in the figure below.
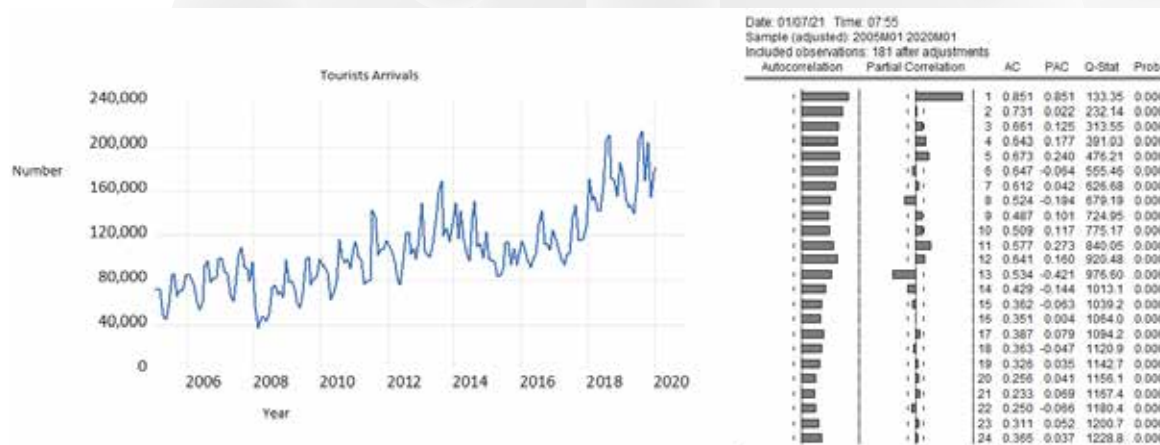
From the figure above, the series is trending upward and is not mean reverting indicating that the data is non-stationary. Similarly, from the correlogram, the pattern of ACF and PACF indicates that there is not any seasonality pattern or repetition in the data. Graph shows some significant autocorrelation that are outside the standard error bound and the autocorrelation depicts exponential decay. From the figure above, it is also obvious that the data starts at a very high correlation. This number is slowly decayed and therefore implies non-stationary properties.

To transform these non-stationary data, differencing is needed. After differencing, ACF plot and PACF plot is shown below. Correlogram of the differenced series was determined and the result indicated that the series is now stationary of order one, I(1) and therefore ARIMA is applicable.
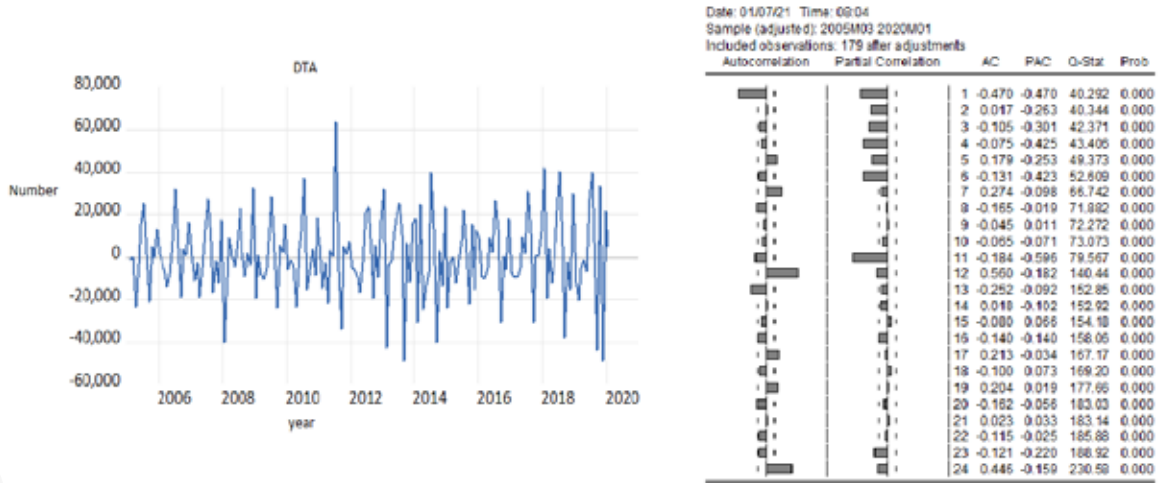
Observing the graph, the series is reverting to its mean after I(1). This means that the order of differencing is 1. From the table, there are similarities between ACF and PACF where both show a decline indicating stationarity, I(1). The ACF shows good exponential decay and a damped sinewave pattern. Lags 3 and 12 are significant. For the PACF lags 3 and 12 are also significant. So this model is not strictly AR or MA but an ARIMA model because both ACF and PACF have the same pattern. The parameter p and q are determined by examining the behaviour of auto-correlation function (ACF) and partial autocorrelation function (PACF).

1.3.2 ESTIMATION OF ARIMA MODEL

Considering parsimony, the most appropriate model is AR (12) AM(12) AM(1). This model is the most appropriate because it has the smallest number of parameters, the highest number of significant coefficients, it has the lowest volatility, it has the highest Adj. R squared and possess the lowest AIC and SBTC. The result of ARIMA model estimation is as indicated below

Dependent Variable: DTA
Method: ARMA Maximum Likelihood (OPG - BHHH)
Date: 01/07/21   Time: 08:29
Sample: 2005M02 2020M01
Included observations: 180
Convergence achieved after 72 iterations
Coefficient covariance computed using outer product of gradients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	567.7828	627.8681	0.904303	0.3671
AR(12)	0.983069	0.012800	76.80025	0.0000
MA(12)	-0.767975	0.070019	-10.96806	0.0000
MA(1)	-0.226763	0.056697	-3.999557	0.0001
SIGMASQ	1.27E+08	11250340	11.25057	0.0000

R-squared	0.627366	Mean dependent var	602.8278
Adjusted R-squared	0.618848	S.D. dependent var	18481.55
S.E. of regression	11410.04	Akaike info criterion	21.66848
Sum squared resid	2.28E+10	Schwarz criterion	21.75718
Log likelihood	-1945.163	Hannan-Quinn criter.	21.70444
F-statistic	73.65735	Durbin-Watson stat	2.218478
Prob(F-statistic)	0.000000		

1.3.3 DIAGNOSTIC TEST- AUTOCORRELATION

Having confirmed that the most appropriate model is AR(12) AM(12) AM(1), a test for autocorrelation was carried out and the results are as indicate below. From the table, results of the analysis indicates that the p values of lag 1-24 are higher than p=0.05 which indicates that there is no autocorrelation in this model, hence good for estimation.

```
Date: 01/07/21  Time: 08:43
Sample (adjusted): 2005M02 2020M01
Included observations: 180 after adjustments
  Autocorrelation    Partial Correlation        AC     PAC   Q-Stat   Prob

                                           1   0.124   0.124   2.8050  0.094
                                           2  -0.021  -0.037   2.8845  0.236
                                           3  -0.020  -0.013   2.9554  0.399
                                           4  -0.056  -0.054   3.5410  0.472
                                           5   0.044   0.058   3.9018  0.564
                                           6   0.006  -0.010   3.9091  0.689
                                           7   0.006   0.008   3.9154  0.789
                                           8   0.058   0.055   4.5519  0.804
                                           9  -0.046  -0.056   4.9522  0.838
                                          10   0.024   0.039   5.0634  0.887
                                          11   0.015   0.006   5.1099  0.926
                                          12   0.024   0.029   5.2224  0.950
                                          13  -0.045  -0.064   5.6165  0.959
                                          14  -0.024   0.002   5.7256  0.973
                                          15  -0.060  -0.064   6.4462  0.971
                                          16   0.083   0.100   7.8238  0.954
                                          17   0.068   0.038   8.7512  0.948
                                          18   0.085   0.077  10.219   0.925
                                          19  -0.004  -0.027  10.222   0.947
                                          20  -0.061  -0.040  10.982   0.947
                                          21   0.009   0.029  10.998   0.963
                                          22   0.116   0.112  13.791   0.909
                                          23  -0.049  -0.084  14.292   0.918
                                          24   0.083   0.093  15.740   0.897
```
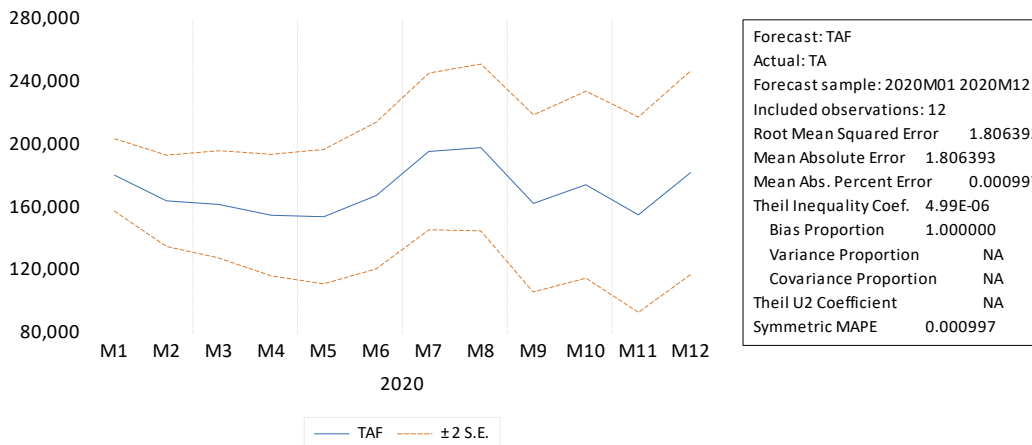
1.3.4 FORECASTING

After building the model, a forecast for Kenya's monthly tourist arrivals was created. The graph below represents the forecast graph for Kenya's tourists' arrivals for the year 2020 that lies within the (_-^+)2 standard error

Forecast: TAF	
Actual: TA	
Forecast sample: 2020M01 2020M12	
Included observations: 12	
Root Mean Squared Error	1.806393
Mean Absolute Error	1.806393
Mean Abs. Percent Error	0.000997
Theil Inequality Coef.	4.99E-06
Bias Proportion	1.000000
Variance Proportion	NA
Covariance Proportion	NA
Theil U2 Coefficient	NA
Symmetric MAPE	0.000997

The forecasting result of 2020 is therefore is as follows:

Last updated: 01/07/21 - 09:07
Modified: 2020M01 2020M12 =>
smpl 2020m01 2020m12forecast(e, g) tafsmpl 2005m01 2020m12

2020M01	181140.193...
2020M02	164563.291...
2020M03	162295.924...
2020M04	155413.439...
2020M05	154415.700...
2020M06	167950.598...
2020M07	196040.097...
2020M08	198569.631...
2020M09	162901.530...
2020M10	174863.760...
2020M11	155603.167...
2020M12	182685.407...

The forecasting result of 2021 is therefore is as follows: :

Last updated: 05/11/21 - 17:36
Modified: 2019M01 2021M12 =>
smpl 2019m01 2021m12forecast(e, g) tdfsmpl 2005m01 2021m...

2021M01	205917.6
2021M02	186478.0
2021M03	184141.7
2021M04	174778.9
2021M05	176843.3
2021M06	184702.8
2021M07	212837.2
2021M08	217010.3
2021M09	185328.0
2021M10	189211.9
2021M11	184394.4
2021M12	204613.9

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