Economics of Wildlife Tourism and Its Challenges:
A Case Study of Nimule National Park, South Sudan

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Wildlife tourism plays an important role in the generation of foreign revenues in many developing countries, although its role is becoming increasingly less feasible. This study sought to determine the economics of wildlife tourism between 2009-2014 and the communities' perception of Nimule National Park (NNP). A randomly collected cross-sectional survey data of 300 participants were used and the descriptive and inferential analyses were done using PAST statistical software program. The results showed total income generated between 2009 and 2014 was 21,548.15 USD, with 2012 earning the largest share (10,319 USD). 92% of tourists who visited NNP were foreigners, majorly for wildlife watching (48%) and photographing. Local communities' benefits were wild fruits and fuelwood collection. About 60% of respondents opposed park entry charges, although most were subjective. Human-wildlife conflicts (73.8%) and poor infrastructure (66.4%) were the communities' and park's challenges. Notwithstanding the unexpected conflict in 2013, the tourism sector can still be promising with genuine peace or security in the country.

Keywords: wildlife tourism, conservation, economics of wildlife, Nimule National Park, South Sudan

INTRODUCTION

Wildlife tourism involves encounters with non-domesticated animals in their natural environment or captivity. It includes various activities, such as bird-watching, whale-watching, general wildlife viewing, visiting zoos, and national parks, snorkeling to view underwater life, sports hunting, and recreational fishing (King & Nair, 2013). This generative process has evolved over time. In the recent past, before mass tourism, visitors were content with viewing displayed animals in zoological gardens. Nowadays, many tourists prefer to see and interact directly with wild species in their habitats and experience a much more intimate closeness to authentic habitats (Mmopelwa *et al.*, 2007).

Tourism potentially constitutes one of the fastest-growing sectors in many developing and third-world countries. It is the main source of foreign currency for at least 38% of developing countries, generating up to 80% of the foreign earnings (Mintel, 2008). In addition, it provides employment opportunities, income for many people, and steering of the development process in most countries. As wildlife is a significant part of tourism, it should play an important role in economic development and foreign currency generation. However, in many countries around the globe, its contribution is relatively low or even not known.

Although tourism has many benefits, it can cause negative impacts on socio-economic and environmental disorders and costs which, if not taken care of can ruin the industry. However, this depends on a number of factors, including the number of tourists visiting the country, the structure of the economy of the country offering tourism, the nature of tourism activity, and the type and susceptibility of the local environment to damage (du Plessie *et al.,* 2012; Mvula, 2001; Benson, 2001; Upeneja *et al*., 2001).

The tourism industry in South Sudan and Nimule National Park, in particular, is very young and has not been explored and properly utilized given that for a long time it has been depressed due to the persisting civil war. This further affected the wildlife viewing experience in the park which dwindling wildlife populations have also limited due to poaching and overexploitation during the civil war. However, with proper protection and conservation, wildlife diversity and numbers can easily improve in the park as it boosts habitat for many wildlife species such as elephants, hippopotamuses, Uganda kobs, antelope, and several species of birds and plants (Baya, 2016). The park is the only place in South Sudan where elephants inhabit and can easily be seen. Another interesting prospect for the park is the possible existence of a chimpanzee population utilizing the park's northern corner. If investigations confirm the existence of this population, this will be a good marketing point for the park.

Apart from the insecurity, other challenges crippling the park's tourism industry include lack of infrastructure and marketing (Tekin, 2015). Despite having many small and private accommodations within the locality, the only lodge available for tourists is the Nimule Lodge, which is located in the Buffer Zone adjacent to NNP with a limited number of rooms/spaces. Nimule Lodge is a facility owned and under development by the then Ministry of Wildlife Conservation and Tourism (MWC & T). The lodge property is on the hill with a panoramic view of the meandering White Nile and NNP. It offers approximately 20 beds in numerous individual structures, as well as dining facilities, a swimming pool (partially finished), and conference facilities. As highlighted in other programs, access to the park is limited by bad roads and inadequate boats to cross the Nile. Therefore, it has become unclear whether wildlife tourism contributes positively or negatively to the park. The generation of this information will enable the understanding of the contribution of this vital sector to the development and generation of foreign revenue. The study, therefore, aimed to determine the income generated from wildlife tourism in NNP between 2009 and 2014; determine the composition and the tourists' peak time preferred for visiting the park; determine trends in tourist numbers in the park; and assess the community perception of benefits and challenges from NNP. Specifically, the study hypothesized and answered the following questions;

1. How do the number of tourists and the income generated by wildlife tourism vary over time?
2. What are the essential benefits indigenous communities obtained from NNP?
3. How are the communities living within and surrounding NNP affected by their co-existence with wildlife?
4. Is payment for park entry charges/fees positively perceived by the local communities surrounding NNP?

THE STUDY METHODOLOGY

Study Area

The Republic of South Sudan is the world's newest country. It is establishing itself as a market-driven economic force on the African continent, endowed with key economic opportunities in the tourism sector (Christie *et al*., 2013). The country is blessed with an abundance of wildlife and natural features, including rivers, mountains, and the second-largest wildlife migration population in the world after Serengeti in Tanzania. However, the tourism industry has not been explored and properly utilized given that for a long

time it has been depressed due to the persisting civil wars that crippled most parks' tourism industry. Furthermore, tourism is also affected by a lack of infrastructure and marketing, inadequate staffing and training, disease outbreaks, natural disasters, and political instability (Tekin, 2015; Baker, 2015).

FIGURE 1
MAP OF NIMULE NATIONAL PARK SHOWING THE STUDY LOCATION
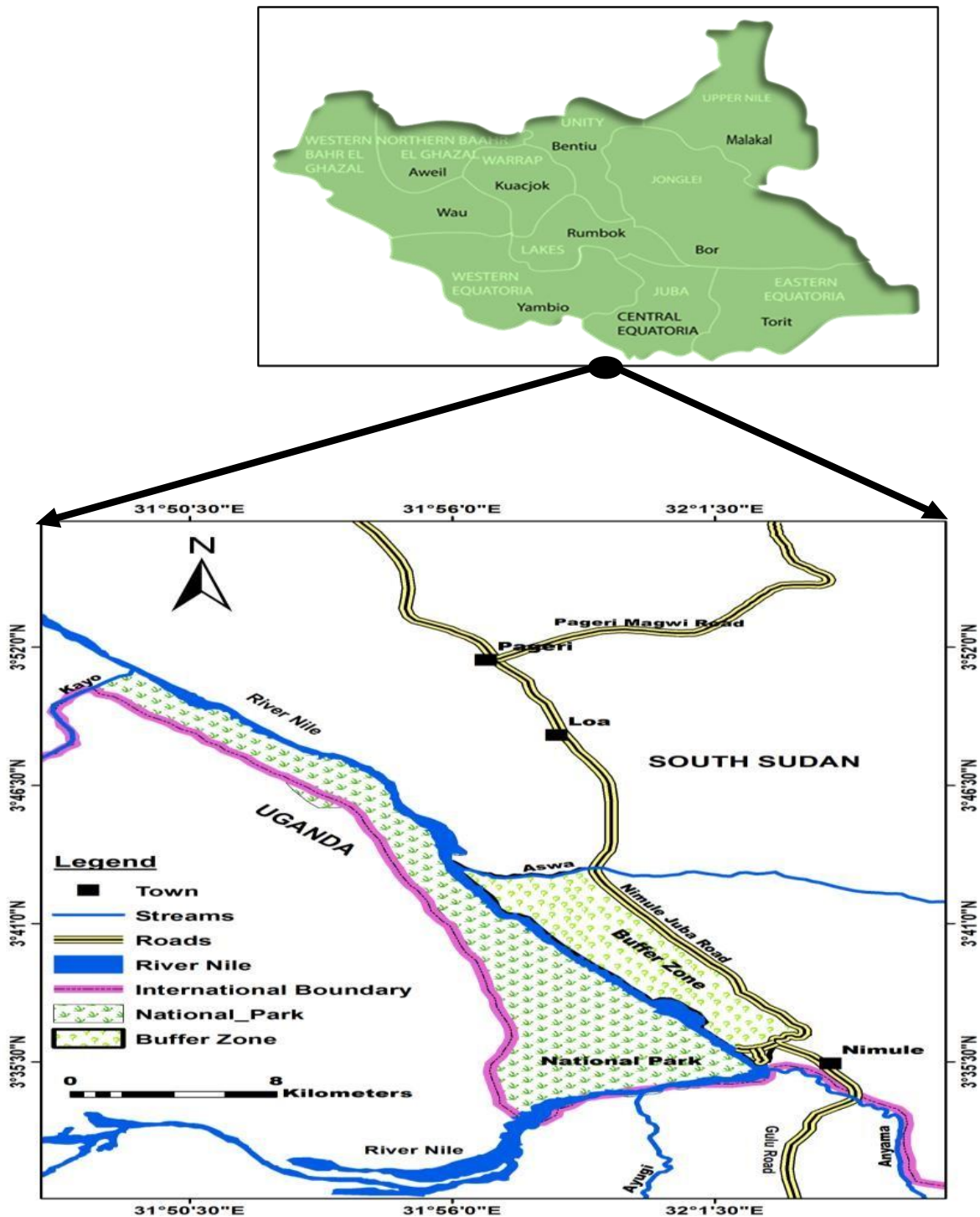
(Source: Tomor et al., 2022; Morjan et al. (2000))

Nimule National Park (NNP) would be one of the model parks for tourism development given its accessibility compared to other parks in South Sudan. The British colonial power established the Park in 1935 as a Game Reserve before being designated as a National Park in 1954. It is one of the smallest parks in South Sudan, covering 256 km^2, and has a gazetted buffer zone area of 154 km^2, adding up to about 410 km² (Hillman, 1982). It is situated in Magwi County of Eastern Equatoria State, in southernmost South Sudan, where it borders Uganda (Brown, 2013). Nimule National Park lies between latitudes 3.35⁰:3 and 3.49^0:2N and longitudes 31.48^0:3 and 32.2^0:2E (Figure 1).

The park has unique and outstandingly varied scenic landscapes. Chief among them are the Rapid Fulla Falls and the Nile River itself. The Nile, which is the longest river in Africa, meanders around, and its other features make it one of the saleable assets that the park has. The river presents opportunities for different tourism activities such as rafting, boat riding, canoeing, sport fishing, viewing, snorkeling, etc. (Okello and Novelli, 2014). These features attract tourists to the park and thus contribute to income generation. It has a continental type of climate characterized by orographic and conventional rainfall with thunderstorms. The rainy season in the park lasts from April to the end of November, while the dry season runs from December to March. The mean annual rainfall in the park varies from 1000 to 1200mm, and the mean daily temperature is 27^0 C, with the maximum and minimum temperatures being 29^{0}C and 24^{0}C in March and July, respectively.

The vegetation of the park is dominated by deciduous high woodland savannah. It is characterized by broad-leafed and more foliage trees, some deciduous and others evergreen. The grass in the park is mostly perennial and grows to a height of 1 – 1.5 meters. The park was established mainly for the protection of now-extinct white *rhinos* (*Ceratotherium simum cottoni*). Other fauna of the park includes elephants (*Loxodonta africana*), Hippopotamus (*Hippopotamus amphibious*), Uganda Kob (*Kobus kob*), Oribi (*Ourebia ourebi*) hyrax (*Procavia capensis*), baboon *(Papio Anubis)*, vervet monkeys *(Cercopithecus)*, common jackal *(Canis aureus)* and leopards (*Panthera pardus*), among many other mammals (Nabi, 1956). Herpetofauna of the park includes the Nile crocodile (*Crocodilus niloticus*), Nile Monitor lizard (*Varanus niloticus*), Savanna Monitor lizard (*Varanus exanthematicus*), and African rock python (*Python sebae*) and many other lizard species and amphibian species as well as a diverse avifauna (Baya, 2016; Hillman and Fryxell, 1988). The African savanna elephant currently is the major biodiversity component of the landscape that survived three wars. It is known to expand its foraging to areas outside the park's boundary in Adjumani District in Uganda and Magwi County in South Sudan causing human-wildlife conflicts with the surrounding communities. An aerial survey of the park reported a total count of 69 elephants in 2008 living in four herds, one of which is a bachelor herd of 10 individuals (Tomor *et al*., 2022; Fay *et al*., 2008). These herds are said to be more destructive to human lives and property as they encroach on the communities adjacent to the park (Tomor *et al*., 2022; Mayele and Woja, 2022).

Research Design, Sample Size, and Sampling Procedure

The study adopted a cross-sectional survey using both primary and secondary data. The primary data were randomly collected from 150 key informants (park personnel) and those living in the park neighborhood whereas the secondary data and statistics were randomly retrieved from 150 previous tourist visiting/activities reports (NNP Wildlife Authority Administration Office, 2014). This makes a total sample of 300 observations (i.e., 150 KII respondents & 150 tourists' report data). The surveyed primary data sources involve the use of questionnaires, oral interviews, observations, and image capturing (photographs) by digital camera. Furthermore, for the primary data, a pilot survey was conducted to test a few samples of structured questionnaires. This was to evaluate its strengths and weaknesses and improve its reliability and for clarity checks. After that, certain adjustments were made and incorporated into the questionnaires.

The data collection majorly focused on the independent variables retrieved from previous tourists' records and from the primary sources as well, which include the composition of tourists by nationality (being international or domestic), the purpose of tourists visiting NNP, income generated from wildlife tourism, the peak time for tourism activity, their entry fees, the season of the visit information, and the trend in tourism activity over the selected years (2009-2014 period) of wildlife recreational activity, expenses per

month, communities' benefits and challenges due to wildlife tourism in NNP with variables described and defined in Table 1. This information was then recorded and tallied for further analysis.

TABLE 1
DEFINITION OF THE SELECTED VARIABLES FOR BOTH PRIMARY AND SECONDARY DATA OF TOURISTS AND KIIS

QNumber	Number of observations
Gender	Male=1, Female=0
Age	Continuous, age of respondents
Marital	1 if married, and 0 otherwise
Education	1 if educated, and 0 otherwise respondents
Duration of stay	Length of stay in NNP/days for tourists
Household size	Tourists family size
Male hh members	Number of male tourist family members
Female hh members	Number of female tourist family members
Income source	Source of income from tourism activity
Lodging exp.	1 if source of expenditure, and 0 otherwise
Food exp.	1 if source of expenditure, and 0 otherwise
Drinks exp.	1 if source of expenditure, and 0 otherwise
Transport exp.	1 if source of expenditure, and 0 otherwise
Casual work exp.	1 if source of expenditure, and 0 otherwise
Other utility exp.	1 if source of expenditure, and 0 otherwise
Occupation	Respondents' work
Visits	1 if first visit, and 0 otherwise
Overnight stay	1 if visit involved overnight stay at the park, and 0 otherwise.
Averdomesticvisitorexpday	Average cost per person/day for domestic visitor.
Aversouthsudanvisitorsexpday	Average cost per person/day for visitors living within South Sudan
AverOverseavisitorsexpday	Average cost per person/day for overseas visitors
AverOvernightVisitorDomestic	Average cost for Overnight show for local tourist/day
AverOvernightsouthsudan	Average cost for Overnight show for South Sudan tourist/day
AverOvernightOverseas	Average cost for Overnight show for Overseas tourist/day
Wild fruits collection	1 if a benefit, and 0 otherwise
Fuelwood collection	1 if a benefit, and 0 otherwise
Fishing benefits	1 if a benefit, and 0 otherwise
Timber/pole for construction	1 if a benefit, and 0 otherwise
Grazing of livestock	1 if a benefit, and 0 otherwise
Fetch water for domestic use	1 if a benefit, and 0 otherwise
Medicinals/herbs collection	1 if a benefit, and 0 otherwise
Bushmeat hunting	1 if a benefit, and 0 otherwise
MemberNatCon	1 if tourist is a member of Nature conservation, and 0 otherwise
Tourists' experience	1 for more than 5 years' experience, and 0 otherwise
Attitude towards tourism	1 if positive towards tourism, and 0 otherwise
Insecurity within the park	1 if a challenge, and 0 otherwise
Human-wildlife conflicts	1 if a challenge, and 0 otherwise
Livestock predation	1 if a challenge, and 0 otherwise
Park entry restrictions	1 if a challenge, and 0 otherwise
High taxes/entry fees	1 if a challenge, and 0 otherwise
Poor infrastructures/roads	1 if a challenge, and 0 otherwise
Poor relationship	1 if a challenge, and 0 otherwise

Data Analysis

The raw data from primary and secondary sources were cleaned, coded, entered, and managed in individual analytical tools. The data were then subjected to descriptive and inferential statistical analysis using the software program PAST, which integrates spreadsheet-type data entry with univariate statistics, curve fitting, time-series analysis, and simple data plotting (Hammer *et al.*, 2001). The analyzed content was further depicted in frequencies, percentages, means, mean standard errors and deviations, and level of significance. The results were then displayed as tables, graphs, and charts.

Empirical Estimation Model of the Study

In order to represent the relationship between a scalar answer and one or more explanatory factors, multiple linear regression is used.

Model Specification

$$\boldsymbol{TEXP} = \beta_0 X + X_1 + X_2 + X_3 \ldots \ldots + \varepsilon \tag{1}$$

where   TEXP = Tourist's source of expenditure
X_1 = Lodging exp
X_2 = Food exp
X_3 = Drinks/bar exp
X_4 = Transport exp
X_5 = Causal works exp
X_6 = Pay other utilities
β = intercept
ε = error term

$$\boldsymbol{EcoB} = \beta_0 X + X_1 + X_2 + X_3 \ldots \ldots + \varepsilon \tag{2}$$

where   EcoB = Economic benefits of the park
X_1 = Fuelwood
X_2 = Fishing
X_3 = Timber/poles
X_4 = Grazing livestock
X_5 = Medicinals/herbs
X_6 = Fetching water
X_7 = Wild fruits/food
X_8 = Bushmeat/hunting
β = is called the intercept
ε = error term

Ranking Income Sources

To rank sources of each income priority, weights were assigned to each priority. The greatest priority was assigned a rank of 1 and the least priority was ranked 6. Those without answers were ranked 0 (Mayele and Bongo, 2022). The mean ranks were obtained by multiplying each assigned weight by its respective number of respondents for each named income source (Table 4). This was calculated by the formula below:

$$Mean\ Rank = \sum \left\{ \frac{(Weights \times number\ of\ respondents\ for\ each\ weight)}{(Total\ number\ of\ respondents\ for\ each\ weight\ (N))} \right\} \tag{3}$$

RESULTS

Socio-Economic Characteristics of the Respondents

The statistics show that the gender of those who participated in wildlife tourism activities constituted an average age of 30 years. The results also indicated tourists have been in NNP for a mean period of at least 11 days of a visit. A total of 4 members constituted the tourist household size with a maximum of 3 and 4, male and female household members respectively (Table 2a). The average monthly household income was about 1628.2 USD with a maximum range between 360 to 7500 USD, with an estimated average monthly expenditure of 1650.5 USD used on tourist activities. Most tourists have more than 7 years of experience and a positive attitude towards wildlife tourism (Table 2a).

TABLE 2A
DESCRIPTIVE STATISTICS OF SECONDARY DATA FOR TOURISTS WHO VISITED NNP
(N=150)

Variable	Obs (N)	Min	Mean	Std. dev.	Max
QNumber	150	1	75.5	43.44537	150
Socio-demographic characteristics					
Gender	150	0	.6533333	.4775028	1
Age (years)	150	3	30.42667	14.16364	57
Marital	150	1	1.393333	.7934012	5
Education	150	1	2.406667	1.159129	5
Duration of Stay/days	150	3	11.45333	10.0866	45
Household Size	150	1	1.626667	.7988806	4
Male mem	150	1	1.44	.6901026	3
Female mem	150	1	2.34	1.134156	4
Income source	150	1	2.313333	1.346817	5
Occupation	150	1	1.666667	1.628878	8
HH income/month (USD)	150	360	1628.2	1179.848	7500
HH Expenditure/month (USD)	150	300	1650.467	788.9883	4000
Tourist expenditure/cost					
Lodging exp.	150	0	.8666667	.3410734	1
Food exp.	150	0	.7733333	.4200778	1
Drinks exp.	150	0	.6933333	.4626545	1
Transport exp.	150	0	.4933333	.5016305	1
Casual work exp.	150	0	.5733333	.4962499	1
Other utility exp.	150	0	.94	.2382824	1
Overnight stay	150	0	.86	.3481495	1
Averdomesticvisitorexpday	150	5	9.526667	4.06771	25
Aversouthsudanvisitorsexpday	150	10	21.06667	5.72369	35
AverOverseavisitorsexpday	150	35	48.75333	6.93879	75
AverOvernightVisitorDomestic	150	25	40.1	7.361016	50
AverOvernightsouthsudan	150	50	69.37333	8.071448	80
AverOvernightOverseas	150	105	138	9.921166	160
Others					
Visits	150	0	.8933333	.3097231	1
Member NatCon	150	0	.54	.5000671	1
Experience (years)	150	1	7.046667	3.597793	20
Positive attitude towards tourism	150	0	.7666667	.4243695	1

The communities benefit from the collection of fuelwood and wild fruits reported by 73% and 65% respectively. Their major challenges were human-wildlife conflicts, poor infrastructures (roads), insecurity from poachers, and livestock predation reported by 73%, 66%, 60%, and 46% respectively (Table 2b).

TABLE 2B
DESCRIPTIVE STATISTICS OF KEY INFORMANT INTERVIEW RESPONDENTS IN NNP
(N=150)

Variable	Obs	Min	Mean	Std. dev	Max
Benefits					
Fetch water inside NNP for domestic use	150	0	.1533333	.3615156	1
Fuelwood collection	150	0	.7333333	.4436981	1
Fishing benefits	150	0	.4933333	.5016305	1
Timber/pole for construction	150	0	.3933333	.4901262	1
Grazing of livestock	150	0	.3666667	.4835088	1
Wild fruits collection	150	0	.6533333	.4775028	1
Medicinals/herbs collection	150	0	.6066667	.4901262	1
Bushmeat hunting	150	0	.22	.4156341	1
Challenges					
Insecurity within the park	150	0	.6066667	.4901262	1
Human-wildlife conflicts	150	0	.7333333	.4436981	1
Livestock predation	150	0	.4666667	.500559	1
Park entry restrictions	150	0	.5	.501675	1
High taxes/entry fees	150	0	.26	.4401037	1
Poor infrastructures/roads	150	0	.66	.4752957	1
Poor relationship with wildlife personnel	150	0	0.3	.4597928	1

The Composition of Tourists Visiting Nimule National Park by Nationality

The statistics show **522** tourists from eleven nationalities visited Nimule National Park from 2009-2014, with 482 foreigners who make up 92% and only 40 (8%) comprised of domestic tourists (South Sudanese). Of these, British nationals had more individuals (**28%**), followed by Canada (**13%**) and Australia (**2%**) being the least (Figure 2) (NNP Wildlife Authority Administration Office, 2014).

FIGURE 2
COMPOSITION OF TOURISTS WHO VISITED NIMULE NATIONAL PARK FROM 2009-2014
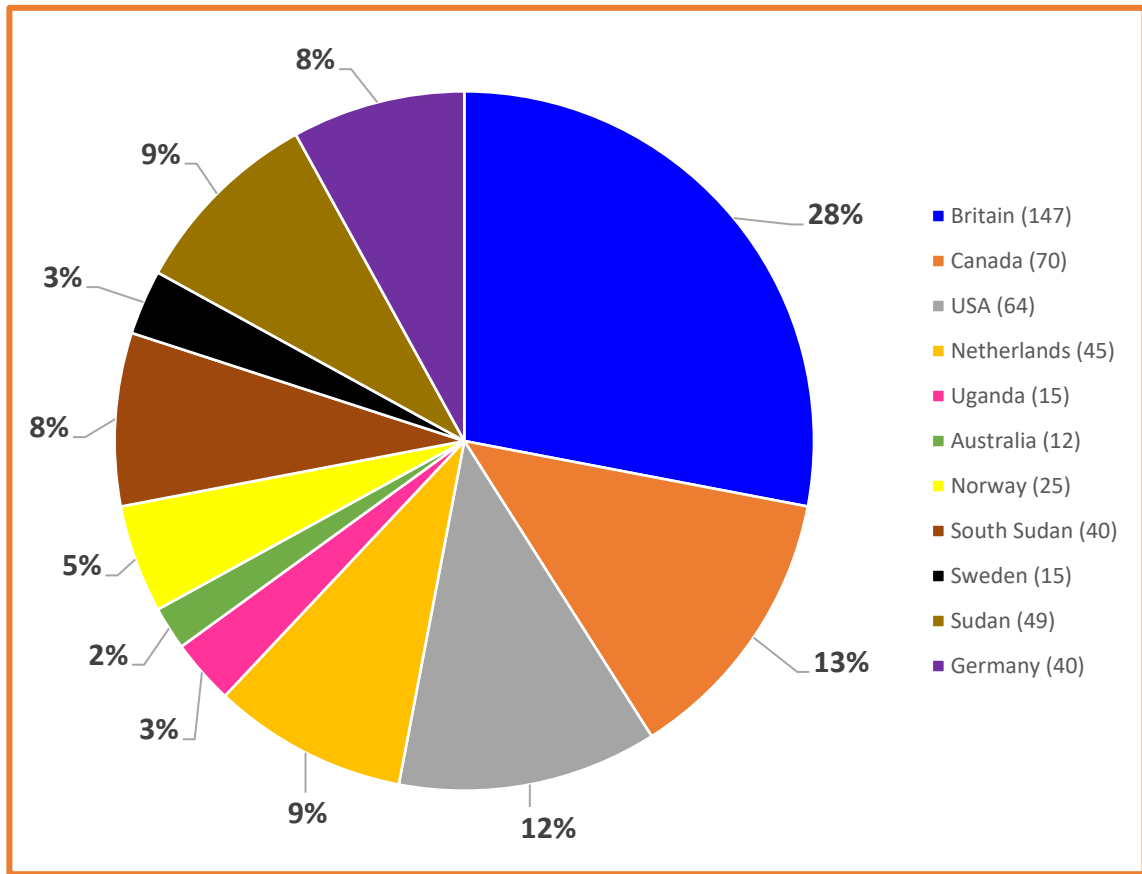
Peak Time and Trend of Tourism Activity in Nimule National Park

Tourists visited Nimule National Park mostly in February, March, May, July, October, and November during the 2009-2014 period (Figure 3). The results show that 2013 registered the highest number (148) of tourists, with the lowest number of 45 and 14 tourists registered in 2010 and 2014 respectively. Tourism activities started quite strongly in 2009 before dropping in 2010 and again started picking up steadily until 2013 before falling sharply in 2014 (Figure 4).

FIGURE 3
PEAK TIME FOR TOURISTS' ACTIVITIES IN NIMULE NATIONAL PARK FROM 2009-2014
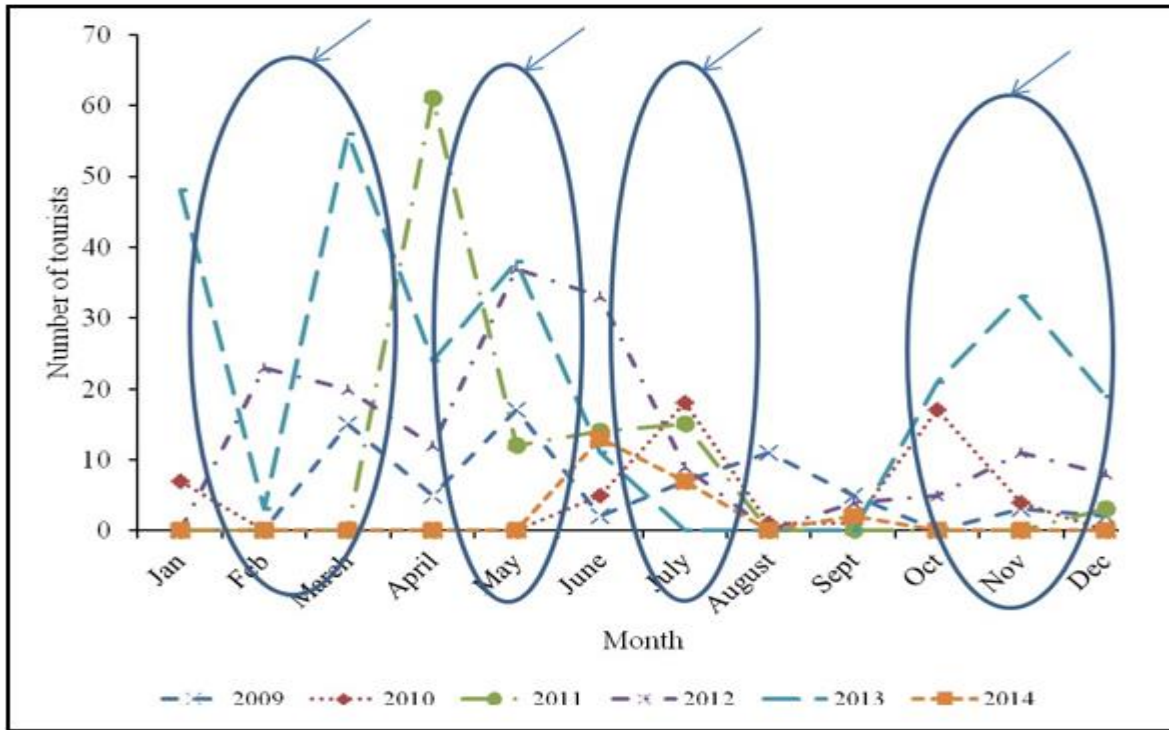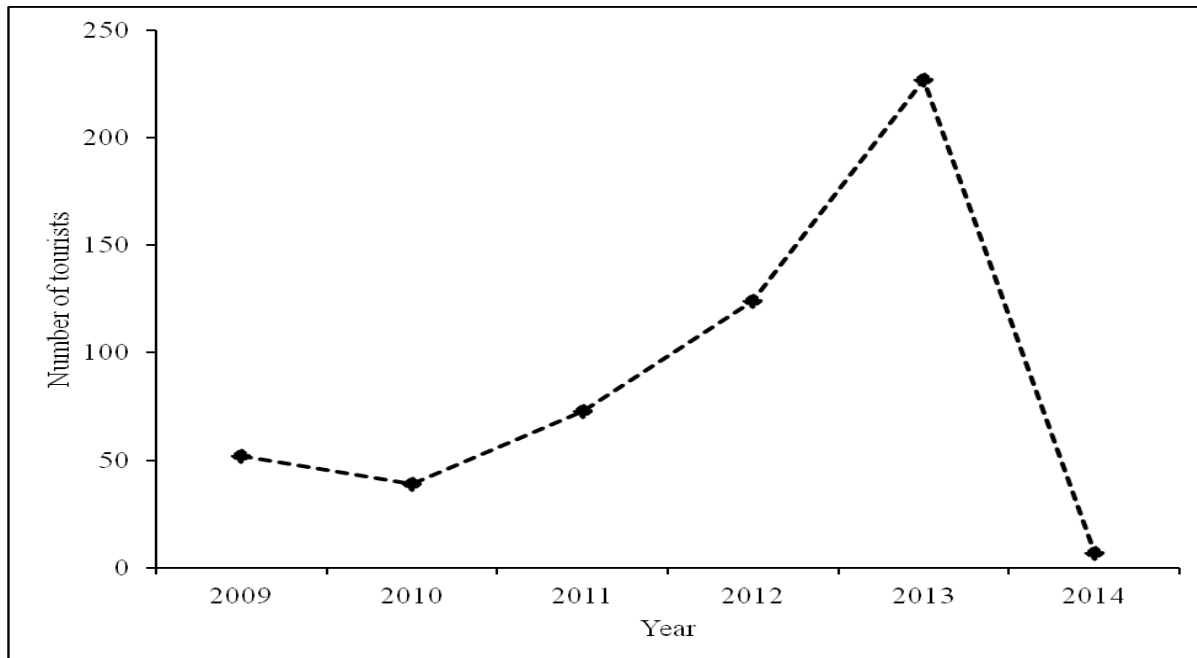

FIGURE 4
THE TREND IN TOURISTS NUMBERS VISITING NNP FROM 2009-2014

The Tourists' Purpose for Visiting the Park

The results revealed the main reasons tourists visited Nimule National Park are wildlife watching (48), followed by rafting (16.3), and photographing the animals and beautiful scenery (14.3), whereas few tourists visited the park to undertake research studies (Table 3).

TABLE 3
TOURISTS' PURPOSE FOR VISITING NIMULE NATIONAL PARK FROM 2009-2014

Year	Wildlife watching	Photographing	Rafting	Research
2009	44.0	32.0	0.0	18.0
2010	21.0	44.0	0.0	0.0
2011	37.0	3.0	29.0	8.0
2012	76.0	0.0	46.0	0.0
2013	96.0	7.0	23.0	22.0
2014	14.0	0.0	0.0	0.0
Mean	**48.0**	**14.3**	**16.3**	**8.0**
Std. Error	**±13.1**	**±7.7**	**±7.9**	**±4.0**

The Income Generated Through Wildlife Tourism Activities Between 2010 and 2014

The park's total income (entry fees, NNP lodging services & taxes) raised through wildlife tourism in the five years was Twenty-one thousand five hundred and forty-eight U.S Dollars (21,548 USD) with the highest income (10,319 USD) in the year 2012 followed by (8, 201 USD) in the year 2013 which dropped by 21% from the value observed in 2012. The least income generated (900 USD) was seen in the year 2010 (Figure 5).

FIGURE 5
INCOME ACCRUED TO WILDLIFE TOURISM IN NNP FROM 2010-2014
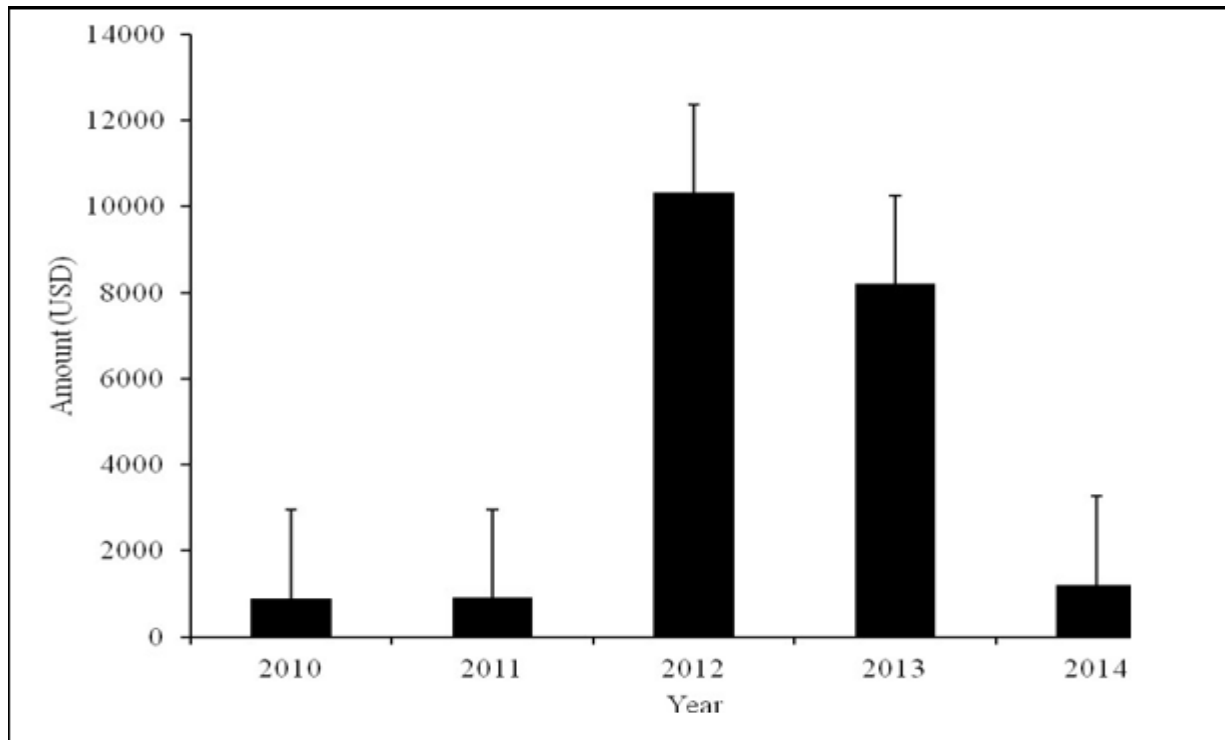
Perceived Sources of Income Generated From Wildlife Tourism in NNP

When incomes were ranked, the major sources from tourists were associated with viewing Rapid Fulla Falls (ranked number 1), followed by wildlife watching (ranked 2), and those who were attracted to photograph wildlife species, including beautiful scenery, ranked 3 (Table 4).

The Major Sources of Expenditures Incurred by Tourists Due to Wildlife Tourism in NNP

The regression analysis indicates food expenditure (p=0.008) being highly significant at 1% while casual labor (p=0.061), and transport (p=0.074) are significant expenses both at 10% having an overall level of significance at Prob > F=**0.03**. Although they show weak and statistically negative coefficient values, they affect the tourists' incomes positively (Table 5).

TABLE 4
RANKING OF TOURISTS' PERCEIVED SOURCES OF INCOME FROM WILDLIFE TOURISM (N=150)

Income sources	Weights assigned to each ranking							Mean	
	Gt 1	Gr 2	G 3	L 4	Lr 5	Lt 6	Ne 0	Weight	Rank*
Research studies (N)	19 (0.13)	14 (0.19)	11 (0.22)	32 (0.85)	24 (0.80)	47 (1.88)	3 (0.00)	**4.07**	**(5)**
%	**12.67**	**9.33**	**7.33**	**21.33**	**16.00**	**31.33**	**2.00**	12.67	100
Photographing (N)	56 (0.37)	24 (0.32)	36 (0.72)	13 (0.35)	18 (0.60)	1 (0.04)	2 (0.00)	**2.40**	**(3)**
%	**37.33**	**16.00**	**24.00**	**8.67**	**12.00**	**0.67**	**1.33**	37.33	100
Rafting/boat/swim (N)	39 (0.26)	30 (0.40)	1 (0.02)	22 (0.59)	26 (0.87)	32 (1.28)	0 (0.00)	**3.41**	**(4)**
%	**26.00**	**20.00**	**0.67**	**14.67**	**17.33**	**21.33**	**0.00**	26.00	100
Wildlife watching (N) Elephants, Uganda kobs, hippopotamus, etc	21 (0.14)	43 (0.57)	12 (0.24)	16 (0.43)	3 (0.10)	7 (0.28)	48 (0.00)	**1.76**	**(2)**
%	**14.00**	**28.67**	**8.00**	**10.67**	**2.00**	**4.67**	**32.00**	14.00	100
Rapids Fulla Falls (N)	40 (0.27)	29 (0.39)	9 (0.18)	2 (0.05)	13 (0.43)	3 (0.12)	54 (0.00)	**1.44**	**(1)**
%	**26.67**	**19.33**	**6.00**	**1.33**	**8.67**	**2.00**	**36.00**	26.67	100

Where, N=number of observations; Weights assigned to each ranking: Gt=1=greatest, Gr=2=greater, G=3=great, L=4=low, Lr=5=lower, Lt=6=lowest, Ne=0=none; Weight=the average frequency weights of each income source/activity; and Rank*= average ranked incomes sources.

TABLE 5
THE LINEAR REGRESSION OF TOURISTS EXPENDITURES IN NNP (N=150)

Source	SS	df	MS
Model	25945.7087	6	4324.28478
Residual	255291.791	143	1785.25728
Total	**281237.5**	**149**	**1887.5**

Number of obs = 150
$F_{(8, 141)}$ = 2.42
Prob > F = 0.0293
R-squared = 0.0923
Adj R-squared = 0.0542
Root MSE = 42.252

Tourismexp	Coefficient	Std. err.	t	P>|t|	[95%conf. interval]	
Lodging exp	10.17198	10.40307	0.98	0.330	-10.39168	30.7356
Food exp	-22.60017	8.427092	-2.68	0.008**	-39.25794	-5.942404
Drinks/bar exp	7.313221	7.665455	0.95	0.342	-7.839023	722.46547
Transport exp	-12.53798	6.962997	-1.80	0.074*	-26.30169	1.225717
Casual works exp	13.48325	7.134803	1.89	0.061*	-.6200566	27.58656
Pay other utilities	14.84441	14.71218	1.01	0.315	-14.23705	43.92587
_cons	63.59251	18.60262	3.42	0.001	26.82087	100.3642

*p<0.05; **p<0.01

The Average Cost for Wildlife Tourism per Day or Overnight Within a 15-25 Kilometers Radius

The results show a distinct change in the amount paid by all categories of visitors from day to overnight tourism shows. Local tourists/residents pay approximately less for both day and overnight tourism services per person reported by 10% and 40% respectively, as compared to those within South Sudan, and overseas tourists. The overall trend shows overseas tourists pay substantially more for both day (*49 USD*) and overnight (*138 USD*) per person for tourism activities compared to other categories of tourists (Table 6).

TABLE 6
AVERAGE ESTIMATED COST (USD) FOR TOURISM PER PERSON FOR DAY OR OVERNIGHT SHOWS WITHIN A 15-25 KILOMETERS RADIUS OF TOURING IN NNP REPORTED BY THE RESPONDENTS

Visitors origin	Day trippers/tourists (USD)				Overnight guests/tourists (USD)			
	Mean	Std. dev.	Min[m]	Max[m]	Mean	Std. dev.	Min[m]	Max[m]
Local tourists/residents	*9.53*	4.08	5	25	*40.10*	7.36	25	50
Tourists residing in South Sudan but not within the locality	*21.07*	5.72	10	35	*69.37*	8.07	50	80
Overseas visitors/referred to as Guests (international)	*48.75*	6.94	35	75	*138.00*	9.92	105	160
Total (USD)	*79.35*				*247.47*			

(Conversion rate: 1USD:3.60 SSP in 2014; Updated March 2023; 1 USD: 787.11 SSP).

The Benefits/Contributions of Nimule National Park to the Local Communities

The results revealed that there is a significant impact on the collection of wild fruits and fuelwood by the local communities residing proximal to the park with estimated p-values of 0.008 and 0.042 at 1% and 10% levels of significance respectively (Table 7).

TABLE 7
THE LINEAR REGRESSION OF ECONOMIC BENEFITS OBTAINED FROM NNP BY LOCAL COMMUNITIES (N=150)

Economic benefits	Coefficient	Std. err.	t	P>|t|	[95%conf. interval]	
Fuelwood collection	.7217712	.3520596	2.05	0.042*	.0257735	1.417769
Fishing	.0472053	.3049328	0.15	0.877	-.555626	.6500366
Timber/poles	-.0546392	.3162115	-0.17	0.863	-.6797677	.5704894
Grazing livestock	.1036276	.3148308	0.33	0.743	-.5187713	.7260264
Medicinals/herbs	.1025223	.314962	0.33	0.745	-.520136	.7251806
Fetching water	-.2343127	.317567	-0.74	0.462	-.862121	.3934956
Wild fruits/food collection	-1.126116	.4199501	-2.68	0.008**	-1.956329	-.2959036
Bushmeat/hunting	-.331347	.3624674	-0.91	0.362	-1.04792	.3852262
_cons	4.347363	.4615816	9.42	0.000	3.434848	5.259878

*p<0.05; **p<0.01

Community Reasons or Perceptions for Whether Tourists Should Be Charged Park Entry Fees or Not

When respondents were asked if tourists should pay park entry charges or not, about 60% responded "No", 36 % responded "Yes", and 4% gave no response. The reasons given varied from one respondent to another. However, about 27% of the respondents supported entry fees subscription to cater for the patrons' workload of care for the tourists while at the site, 24% supported the "User-pay principle" for benefits accrued from NNP, and 21.3% supported entry charges for park improvements and construction of wildlife infrastructures (Figure 6). Only a few respondents, about 5% supported the reasons for park maintenance. On the other hand, with some of them having mixed responses, about 39% presumed to be indigenous respondents were opposed to park entry charges as they reiterated that the land that constituted the national park is their ancestral land and they are the landowners, an inheritance that gave them rights not to pay for entry charges. This is followed by 31.3% of those who claimed that the park is endowed with natural features and so the utility of nature should be free to them since no human effort is being used. Moreover, others believed that the park should be available and accessible to all at any time (13.3%), irrespective of their ability to pay. The government subsidies, however, were not considered valuable as a good reason for not paying park entry charges (Figure 6).

FIGURE 6
**REASONS GIVEN BY RESPONDENTS FOR SUPPORTING OR OPPOSING PARK
ENTRY FEE CHARGES**
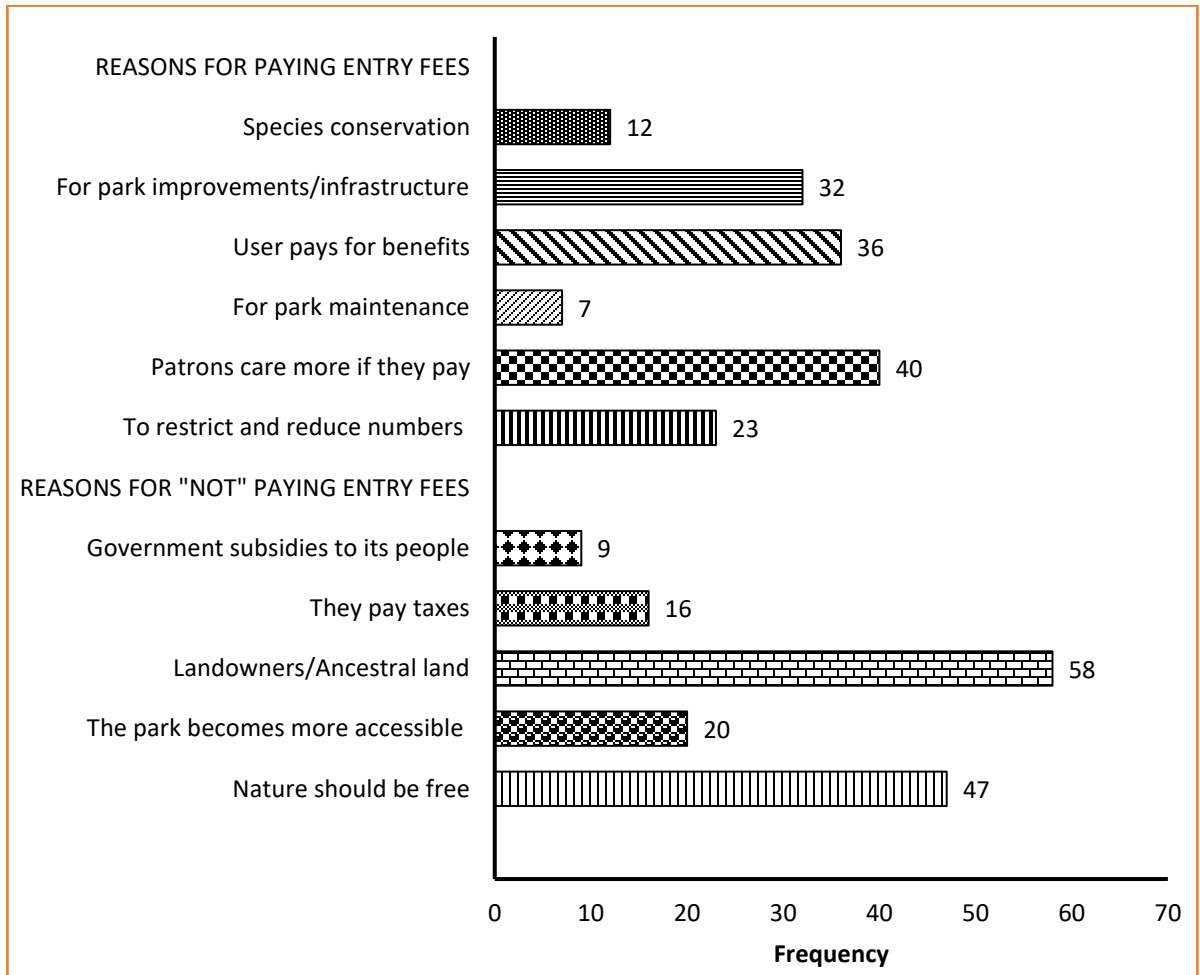
The Challenges Facing Local Communities Due to Wildlife Tourism in NNP

The results show that human-wildlife conflict is the major threat to the communities surrounding NNP, which accounted for 73.8% of responses. This is followed by poor infrastructures (66.4%) such as roads and communication networks, insecurity within the park (61.1%), and park entry restrictions (50.3%) by the wildlife authority. A few respondents did not consider tax payment as a challenge (Table 8).

TABLE 8
THE CHALLENGES FACED BY LOCAL COMMUNITIES SURROUNDING NNP (N=150)

Challenges	Responses		Percent of Cases (%)
	N	Percent (%)	
Human-wildlife conflicts	110	20.8	73.8
Poor infrastructure & comm. networks	99	18.7	66.4
Insecurity within the park	91	17.2	61.1
Park entry restrictions	75	14.2	50.3
Livestock predation	70	13.2	47.0
Poor relationships with the park administration	45	8.5	30.2
High tax payment for benefits accrued from NNP	39	7.4	26.2
Total	**529**	**100.0**	**355.0**
a. Dichotomy group tabulated at value 1.			

DISCUSSION

The tourism industry in South Sudan and Nimule National Park is particularly very small and underutilized despite its high potential to add to national revenue. Besides the above challenges, wildlife-based tourism in Nimule National Park still has great potential and opportunities. This would further contribute to the conservation and management of threatened and nearly extinct wildlife species, and it would act as a source of attracting more tourists to the country as a whole, thus supporting economic growth and development.

The result depicted that people visit the park to watch wildlife, photograph, and rafting because Nimule National Park offers beautiful sceneries and the Fulla rapid falls in addition to large games such as elephants, hippos, Uganda kobs, Giraffes, baboons, monkeys, and many others. These results concurred with the findings of Mmopelwa *et al*., (2007) and other investigators that tourists pay to view Fulla Rapid falls, wildlife, and boating. This is because Nimule National Park has relatively open vegetation and is accessible, and it is the second nearest recreational park with a nice highway in the country, especially for expatriates working in Juba. Nimule National Park is attractive to visitors because it harbors the famous Fulla rapids, the source of the hydroelectric power to-be in South Sudan. The low number of domestic tourists observed in Nimule National Park is similar to what has been observed in Tanzania, and this has been attributed to the low income of the locals, a fact supported by Mariki *et al*., (2011). Results observed on the composition of tourists visiting Nimule National Park agreed with similar findings reported elsewhere that tourists from various countries pay for viewing African wildlife as well as for rafting and photography. These results also agree with the findings reported by Ezeuduji (2019) and Integrate-immigration (2020) from South Africa, which showed that most visitors who come to the country were from overseas.

The premise that the dry season is the preferred season and the peak time for tourists visiting Nimule National Park was not true. This is because the number of tourists also peaked in the months of May and July, which are part of the rainy season. However, the reason that many tourists visit the park in these months may be because the earth is getting warmer and rainfall seems to be getting sporadic and unpredictable as a result of global warming. Also, climate change predictions for South Sudan indicate a significant rise in average temperature; forecasted temperature is expected to range from 1.5ºC to 3.1ºC during August and between 1.1ºC to 2.1ºC during January (IPCC, 2001). In addition, these tourists probably visit the park whenever they have free time. In fact, a good number of them visit the park over the weekends.

The fact that income accrued to wildlife tourism in Nimule National Park is low has been confirmed. This can be attributed to; first, the tourism structure in South Sudan is very rudimentary, which is in line

with the findings of Christie *et al.*, (2013). Secondly, several years of political instability and insecurity made the region an unattractive destination for tourists; this agrees with the results of Okello & Novelli, (2014). Thirdly, low income, insufficient conservation education, and publicity contributed to the low income generated through wildlife tourism in NNP which is supported by the findings of Mariki *et al.*, (2011). Fourthly, environmental pollution that caused wildlife migration is another factor that might have contributed to the low income generated through wildlife tourism in South Sudan, and NNP in particular, a fact noted by du Plessis *et al.*, (2012). Finally, the risk of being attacked by wild animals, especially the danger from the bachelor herd of elephants is yet another factor that scares many tourists from visiting NNP that could have also contributed to the low income, a fact also supported by the study conducted by Leggat & Durrheim, (1999). The overall statistics depicted the generated amount is far lower than that generated by the other countries involved in similar sectors in the region, as noted by Damm (2001).

The changes in the number of tourists and the income generated from wildlife tourism over time proved to be true because the number of tourists rose and fell slightly and then rose again before dropping sharply. The observed steady rise could be associated with the relative peace and the enthusiasm of both the locals and the international communities to support developmental activities in South Sudan. The sharp drop in the number of tourists from 2013 to 2014 could be attributed to the protracted crisis caused by the conflicts of the 15th December 2013. Similar dents in tourist numbers have been observed elsewhere in the continent, for example, Humphreys & Smith, (2011) reported that "war affects tourists in some African countries". Similarly, Christie *et al.* (2013) further indicated that wars negatively influence tourism. The fact that is not an uncommon situation in the Republic of South Sudan.

Furthermore, respondents were asked how much they spent when exploring within and outside NNP in the 15-25 kilometers range. However, NNP and its surrounding villages offer a range of accommodation facilities, charging different rates for different individuals. Because there are always special offers for elderly, pensioners, children, and concessions for regular patrons, it is quite difficult to determine the exact amounts tourists/visitors spend per day or overnight. The finding argued favorably with that of Tisdell (2005) who also reiterated that "there are also special offers for companies and guests for whom expenditures have already been paid in advance". Nevertheless, most tourists/visitors' expenditures are not accurately captured because others bring their food and other requirements directly from home. Although this happened, multiple responses have been harmonized to yield estimates as in table 5 whose findings also confirmed that of Tisdell (2005).

The results further indicated that households who live within and around NNP have a significant impact on the park as they continue extracting benefits from it, as such if this is done continuously for a sustained period without conservation efforts emphasized, the vegetation cover is likely to get destroyed and might escalate to depletion and degradation of the park resources which would retard tourism activities in the park, thus threatening wildlife to migrate. This is arguably in line with Hejcmanova *et al.* (2010) finding. Therefore, for sustainable wildlife tourism, more conservation and management efforts for the park's economic resources should be emphasized.

The human-wildlife conflict as the major challenge could be related to threats posed by wildlife and its village encroachment to feed on crops, which caused crop damage because most wild animals are herbivores that mostly feed on vegetation plants (Musimbi, 2013). It can also be reiterated with concern that loss of lives and properties could be attributed to the extent of their feeding habits, road blockage for humans, and humans settling on wildlife migratory routes. On the other hand, threats posed by human activities of poaching, clearing vegetation, occupying wildlife paths/routes and gazetted areas, and movement along the buffer zone and in protected areas lead to a collision with wild animals in a given space and time (Nyhus, 2016; Mayele & Woja, 2022). Meanwhile, livestock predation could be due to uncontrolled livestock grazing, large herds, overgrazing, and periodic encroachment of the community by wildlife predators/animals (Musimbi, 2013) (Table 8). The elevated predation pressure in farms with dense cover probably stems from reduced visibility of approaching predators, thus increasing their livestock hunting success. The habitats included in the dense cover are often associated with natural succession in farms that have converted from intensive grazing to game farming, reiterated by Hejcmanova *et al.* (2010) which further exacerbated livestock raiding practices, thus further escalating insecurity within the park.

POLICY IMPLICATIONS AND AREAS FOR FUTURE RESEARCH

Both wildlife tourism and environmental conservation can achieve sustained results with the help of a variety of policy tools, including economic ones. Socio-economic improvement is feasible if these policy tools are properly applied. Therefore, economics could be a key factor in ensuring success for conservation and wildlife tourism. This study has drawn some policy implications and areas for future research: It is crucial to consider the financial gains that wildlife tourism brings to the government and the landowners (how much money is made by wildlife tourism in foreign currency, and how much of it should go toward conservation); there needs to be more research done on the welfare impacts of charging fees to publicly run national parks and wildlife tourist spots. Entry fee implications for conservation and infrastructure provision and improvement should also be assessed; In addition to the economic use values, other studies should concentrate on non-use values associated with wildlife tourism; more consideration should be given to the role that market-based mechanisms can play in wildlife tourism and wildlife conservation. Currently, only a small portion of such instruments are used for wildlife tourism; and wildlife tourism still generates little money in NNP, but encroachment by neighboring communities seeking to benefit from the park's wildlife riches has resulted in an increasing degradation of its wildlife resources. Therefore it is essential to understand these factors better because these concerns have profound impacts on the management, planning, and design of wildlife tourism for different stakeholders.

Wildlife is a significant resource with tourism and other economic benefits, but it needs to be used responsibly to preserve it (Tisdell, 2005; Higginbottom, 2004). If the above implications are not considered by all, there is a likelihood of a risk of wildlife tourism disappearing or its use becoming unsustainable. Despite the existing potential for developing new ventures in wildlife tourism, business mechanisms in marketing are paramount. If this is incorporated into management activities, it may be that wildlife tourism can be more profitable than even agricultural production in the long run. This is because it can meet both non-use and use values from the many species, increasing the total economic value placed on wildlife conservation.

CONCLUSION AND RECOMMENDATIONS

The tourism industry in South Sudan and Nimule National Park is particularly very small and underutilized despite its high potential to add to national revenue. However, from the study findings, given the prospects for an increased number of visiting foreign tourists, wildlife-based tourism still has great potential and opportunities to raise incomes for NNP. If well managed and conserved, in the long run, it would subsequently contribute greatly to the national Gross Domestic Product of the country through the generation of revenues. It can bring development to the rural communities as well (Tisdell, 2005). The results revealed a significant impact of a collection of wild fruits and fuelwood on the park (Table 7). This may also indicate that if the communities continue to extract such products from NNP without conservation efforts emphasized, the vegetation cover is likely to get destroyed, threatening wildlife to migrate and thus, affecting wildlife tourism. Even though the majority of local communities are opposed to paying entrance fees to national parks (where they can observe or interact with wildlife), they are less likely to object if they are certain that the money raised will be used to enhance amenities and promote conservation in the areas where the fees are paid (Tisdell, 2005). Therefore, the study has drawn the following recommendations: To avoid negative community perceptions of benefits sharing from wildlife tourism (Ashley and Roe, 1998), the management of Nimule National Park (NNP), and other Protected Areas (PAs) should link the park's entry fees collected to parcels that benefit all so that it becomes socially and politically acceptable by the communities; In addition, to avoid the degradation of NNP due to exploitative benefits extraction, there is a need for joint community participation and engagement in wildlife tourism development, including a need to educate the surrounding communities about how to coexist and live in harmony with wildlife so that species migration and human-wildlife conflicts are avoided at any times through community awareness. To avoid negatively significant impacts caused by local communities on the park and for wildlife tourism to become sustainable, conservation and management efforts for the park's economic resources should be

emphasized. Furthermore, the communities established proximal to the park must vacate, settling close to wildlife migratory routes to prevent human-wildlife conflicts and livestock predation. Security and peace are paramount if the park attracts many tourists, which will also improve its income generation capacity for the country.

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REFERENCES

Ashley, C., & Roe, D. (1998). Enhancing Community involvement in Wildlife tourism: Issues and challenges. *Wildlife and Development Series No.11*. London: International Institute for Environment and Development.

Baker, D.M.A. (2015). *Tourism and the Health Effects of Infectious Diseases: Are There Potential*.

Baya, P.B.N. (2016). *Population Status, Distribution and Trends of African Elephant (Loxodonta Africana, Blumenbach 1797) In Nimule National Park, South Sudan* [Doctoral degree dissertation].

Benson, D.E. (2001). Wildlife and reaction management of private lands in the United States. *Wildlife Society Bulletin*, *29*(1), 359–371.

Brown, B.P. (2013). *Population Status, Distribution and Trends of African Elephant (Loxodonta Africana) in Nimule National Park-South Sudan* [Master thesis, University of Eldoret, Kenya].

Christie, I., Fernandes, E., Messerli, H., & Twining-Ward, L. (2013). *Tourism in Africa: Harnessing tourism for growth and improved livelihoods*.

Damm, G.R. (2001). *The Conservation game* (1st Ed.). Safari Club International African Chapter.

du Plessie Me.-L., van der Merwe, P., & Saayman, M. (2012). *Environmental factors affecting tourism*.

Ezeuduji, I.O. (2019). Tourists' profile and perceptions of a destination brand essence: KwaZuluNatal, South Africa. *African Journal of Hospitality, Tourism and Leisure*, *8*(4). ISSN: 2223-814X.

Fay, J.M., Elkan, P., Morjan, M., & Grossmann, F., (2008). *Aerial Survey of wildlife, livestock, and human activities in and around existing and proposed protected areas of Southern Sudan, dry season 2007*. WCS report, South Sudan Programme.

Freedman, D.A. (2009). *Statistical models: Theory and practice*. Cambridge University Press.

Hammer, Ø., Harper, D.A., & Ryan, P.D. (2001). PAST: Paleontological statistics software package for education and data analysis. *Palaeontologia Electronica*, *4*(1).

Hejcmanová, P., Hejcman, M., Camara, A.A., & Antonínová, M. (2010). Exclusion of livestock grazing and wood collection in dryland Savannah: An effect on long-term vegetation succession. *African Journal of Ecology*, *48*(2), 408–417.

Higginbottom, K. (2004). Wildlife tourism. *CRC for Sustainable Tourism*, *1*(1), 1–301.

Hillman, J. (1982). *Wildlife information booklet. Department of Wildlife Management. Ministry of Wildlife Conservation and Tourism, Sudan. A Report to the Directorate of Wildlife Conservation and National Parks Forces*. Equatorial Region, Juba, 31:1-16.

Hillman, J.C., & Fryxell, J.M. (1988). Section 2: Country Reports. *Antelopes: East and Northeast Africa*, *5*.

Humphreys, J., & Smith, M.L.R. (2011). War and wildlife: The Clausewitz connection. *International Affairs*, *87*(1), 121–142.

Integrate-immigration. (2020). *Which tourists are visiting South Africa?* Retrieved May 29, 2020, from https://www.intergateimmigration.com/blog/tourists-visiting-south-africa/

IPCC. (2001). *Climate Change-Synthesis Report*.

King, N., & Nair, V. (2013). Gap analysis of future studies on wildlife tourism in Lower Kinabatangan, Sabah. In *International Conference on Tourism Development* (pp. 310–322).

Leggat, P.A., & Durrheim, D. (1999). Risk to tourists posed by wild mammals in South Africa. *Journal of Travel and Medicine*, *6*, 172–179.

Mariki, S.B., Hassan, S.N., Maganga, S.L.S., Modest, R.B., & Salehe, F.S. (2011). Wildlife based domestic tourism in Tanzania: Experiences northern tourists' circuit. *Ethiopian Journal of Environmental Studies and Management*, *4*, 62–73.

Mayele, J.M., & Bongo, A.L. (2022). The Community Perceptions and Attitudes about Agroforestry and Impediments to On-farm Trees/Shrubs Growing and Management in Rajaf County-South Sudan. *International Journal of Innovative Science and Research Technology*, *7*(3), 994–1005.

Mayele, J.M., & Woja, V.S. (2022). *Socio-Economic and Environmental Factors Influencing Human-Wildlife Conflict in Nimule National Park-South Sudan*.

Mintel. (2008). *Wildlife Tourism International*. Retrieved from http://reports.mintel.com/

Mmopelwa, G., Kgathi, D.L., & Molefhe, L. (2007). Tourists' perceptions and their willingness to pay for park fees: A case study of self-drive tourists and clients for mobile tour operators in Moremi Game Reserve, Botswana. *Tourism Management*, *28*(4), 1044–1056.

Musimbi, M. (2013). *Factors influencing human wildlife conflict in communities around the park: A case of lake Nakuru National Park* [Doctoral dissertation, University of Nairobi].

Mvula, C. (2001). Fair trade in tourism t protected areas-a micro case study of wildlife tourism to south Luangwa National Park, Zambia. *International Journal of Tourism Research*, *3*, 393–405.

Nabi, S.A. (1956). Protection of Game in the Sudan. *Sudan Notes and Records*, *37*, 119–121.

Nyhus, P.J. (2016). Human–wildlife conflict and coexistence. *Annual Review of Environment and Resources*, *41*, 143–171.

Okello, M.M., & Novelli, M. (2014). Tourism in the East African Community (EAC): Challenges, Opportunities and ways forward. *Tourism and Hospitality Research*, *14*, 53–66.

Tekin, E. (2015). The Impacts of Political and Economic Uncertainties on the Tourism Industry in Turkey. *Mediterranean Journal of Social Sciences*, *6*, S5.

Tisdell, C. (2005). *Economics, ecology and the environment* (No. 41). Working paper.

Tomor, M.*,* Ocaido, M., & Dranzoa, C. (2022). *Home Range and Movement Behaviour of the African savanna Elephant (Loxodonta africana africana. L.) in the Nimule National Park Landscape*.

Upeneja, A., Shafer- E.L., Seo, W., & Yoon. J. (2001). *Economic benefits of sports fishing and angler Research*, *40*(1), 68–78.