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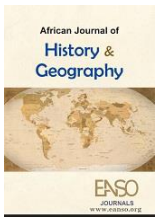

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Original Article

Tourists' Perceived Value of Geotourism Potential in Baringo County, Kenya

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ABSTRACT

Tourism is a key driver of socio-economic development whose continued expansion and growth are key for the economy of many countries The growth and expansion of this sector will however depend upon exploiting other niche areas such as geotourism, as is the case in Europe and Asia This is unlike in most African countries including Kenya which are yet to embrace this sub-sector despite its rich geodiversity. In Baringo County, little is known concerning the perceived value of geotourism's potential to contribute towards diversifying tourism. This study therefore sought to assess tourists' perceived value of geysers and hot springs in Lake Bogoria. This study adopted the Self-Determination theory and survey research method. All the tourists that visited Lake Bogoria during the study period provided the required data. A sample of 385 tourists was purposively selected for interview using a self-administered questionnaire. SPSS was used for the analysis of quantitative data while a modified Strba and Rybar scale was used for interpreting results. The results showed that the geysers and hot springs had high geotouristic value scores, indicating universal suitability for geotourism. They also had iconic value, suitable for recognition as a geosite. These geysers and hot springs offered opportunities for growing geotourism and diversifying tourism. The study concludes that UNESCO Global Geoparks should recognize geysers and hot springs as universal geosites. This study highlights the importance of embracing and promoting geotourism in the study area.

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INTRODUCTION

Tourism is a key driver of socio-economic development whose continued expansion and growth are key for the economy of many countries (United Nations World Tourism Organization [UNWTO], 2019; Strba *et al*., 2020; World Travel and Tourism Council [WTTC], 2022). However, the global pattern, growth, and benefits of tourism are unevenly distributed due to the confined biodiversity of tourist attractions (UNWTO, 2021). Against this backdrop, a new niche area - geotourism, has emerged and is growing rapidly in several countries in Europe and Asia, but also Africa. This tourism venture is offering a new direction for tourism diversification based on geodiversity attractions (Ngwira, 2018; Ólafsdóttir, & Dowling, 2014). UNESCO is one institution that has recognised the potential of geotourism; going on to establish 213 Global Geoparks in 48 countries across the world. These are distributed as follows: Europe (109), China (48), other Asian countries (33), Russian (1), Iran (3), Canada (5) and Mexico (2), South America (11), and New Zealand (1), Morocco (1), and Tanzania (1) (UNESCO, 2024). Africa has only two UNESCO Global Geoparks (KNATCOM, 2023; UNESCO, 2024) despite its rich geodiversity (Ngwira, 2018; Tessema *et al*., 2021).

The current push behind geotourism comes against the backdrop of conventional tourism which has been focused largely on what has come to be referred to as "the Big Five" wild animals – elephant, leopard, rhino, buffalo, and lion that are confined to national parks and reserves (Akama *et al*., 2011; UNWTO, 2015). This has characterized Tourism policy, research, and marketing in most African countries, including Kenya. Consequently, large parts of Kenya, including Baringo County, which are endowed with iconic geological formations such as the Gregory Rift Valley, geysers and hot springs (County Integrated Development Plan [CIDP], 2018; KNATCOM, 2023) continue to lag in embracing geotourism. Kenya's New Tourism Strategy (Government of Kenya [GoK], 2022) advocates for diversifying tourism products by developing and marketing the available tourism potentials; rare birds, rare and unique animals, sports tourism, water sports, and mountain climbing. Hence, persistent neglect of geotourism through the failure of Tourism policy to address itself to geotourism and Global Geoparks.

Studies conducted on the subject of tourism indicate that success in embracing diversification of geotourism potential depends largely on the perceptions of tourism, which influence the utilization and consumption of products associated with this stream (Benur, & Bramwell, 2015; Farmaki, 2012; Ólafsdóttir, & Tverijonaite, 2018). However, despite the recognition and acceptance of geotourism across the world, not much is known concerning the value of geotourism and its potential to contribute towards diversifying tourism products in Baringo County, as well as other parts of Kenya. This is the focus and motivation of this study.

The objective of this study was to assess stakeholders' perception of geotourism as a pathway to diversifying the tourism product portfolio in Baringo County, Kenya. Specifically, the study sought to: (i) evaluate the local community's perception of geodiversity and geotourism potential in the unprotected areas in Baringo County, (ii) analyze tourists' perceived value of landforms that constitute tourism products, and (iii) assess the role and function of Baringo County government and other stakeholders in promoting the development of geotourism products.

LITERATURE REVIEW

Geotourism

Geotourism is a specialized form of tourism that has arisen out of the nexus between geodiversity

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and tourism with an emphasis on appreciating geosites as attractions of universal value to tourists (Newsome *et al*., 2012). In 1995, Hose defined geotourism by stating that;

Geotourism is "The provision of interpretive and service facilities to enable tourists to acquire knowledge and understanding the geology and geomorphology of a site (including its contribution to the development of the Earth sciences) beyond the level of a mere aesthetic appreciation" (Hose, 1995 pg.17).

Further, Rodrigues, & Carvalho (2009) traced the roots of geotourism to 1956 when Italian geologist, Michele Gortani, stated that: "to the geologist's mind, the landscape comes alive and talks; every stone, form of coast or mountain or valley tells its story, evoking the variability of its history and it is becoming" cited in Ngwira (2015 pg.5). Geotourism, therefore is based on perceptive value of geodiversity. However, while this has been acknowledged, most studies on this topic are focused on; the scientific character of geosites; identification, description, and assessment of landforms as a physical entity (Bruschi, & Cendrero, 2005), management of geodiversity and sustainability of tourism with little attention given to tourists' perception of geodiversity (Hose, 1995; Newsome, & Dowling, 2006).

Tourists' Perception and Assessment of Geodiversity Sites

Since geotourism is a form of tourism that is educative (geo-interpretation) and brings satisfaction (Kubalikova, 2013; Ngwira, 2015; UNESCO, 2006) to tourists underpinned by experience-based interpretation of landforms (Gray, 2004), a study of geotourism ought to consider tourists' perception of geodiversity. Perception is one of the most challenging concepts in tourism (Gnanapala, 2015; Stylidis *et al*., 2017) and studies on this topic have embraced the term "perception" as defined by Swarbrooke, & Horner (1999);

"The subjective interpretation by individuals of the data which is available to them, and which results in them having particular opinions of, and attitudes towards products, places and organizations" (Swarbrooke & Horner, 1999: 436).

However, according to Benur, & Bramwell (2015), and Farmaki (2012), researchers and policymakers have not sufficiently embraced tourists' perceived value of geodiversity as tourist attractions. Moreover, Strba *et al*. (2018) observed that the assessment of geodiversity has been left to scientists and practitioners such as geologists and environmentalists whose focus is on the scientific character of geosites. While past geotourism studies focused on expert-based assessment of geodiversity sites (Kubalikova, 2013; Strba, & Rybár, 2015), it is argued in this study that tourists' perception of geodiversity influences the consumption of tourism products. Thus, a study on tourists' perceived value of geotourism is helpful in planning which touristic products to develop and offer to tourists. This suggests that the perception of tourists should be included in the assessment of geodiversity, since it provides guidance in growing geotourism (Saqib, 2019).

Neches (2013) has added weight to the perceived value of geotourism and related issues such as; geodiversity sites assessment and providing infrastructure to ensure a steady supply of geotourism products. Moreover, researchers and expert practitioners in earth sciences have developed quantitative and qualitative methods to assess the scientific character of landforms. These methods have been used in European countries including; Spain (Bruschi, & Cendrero, 2005), Poland (Kubalikova, 2013), and Slovakia (Strba, & Rybár, 2015) to assess and establish geosites of universal importance. According to Strba, & Rybar (2015), geodiversity assessment methods can be modified to suit local geographical conditions such as the physical character of the destination. While making a case for tourist-based assessment of geosites, Daniel (2001) argued that perception-based assessment involves a vivid impression of geodiversity as is experienced by visitors. Perception based-assessment is more reliable than the expert-based assessment, which

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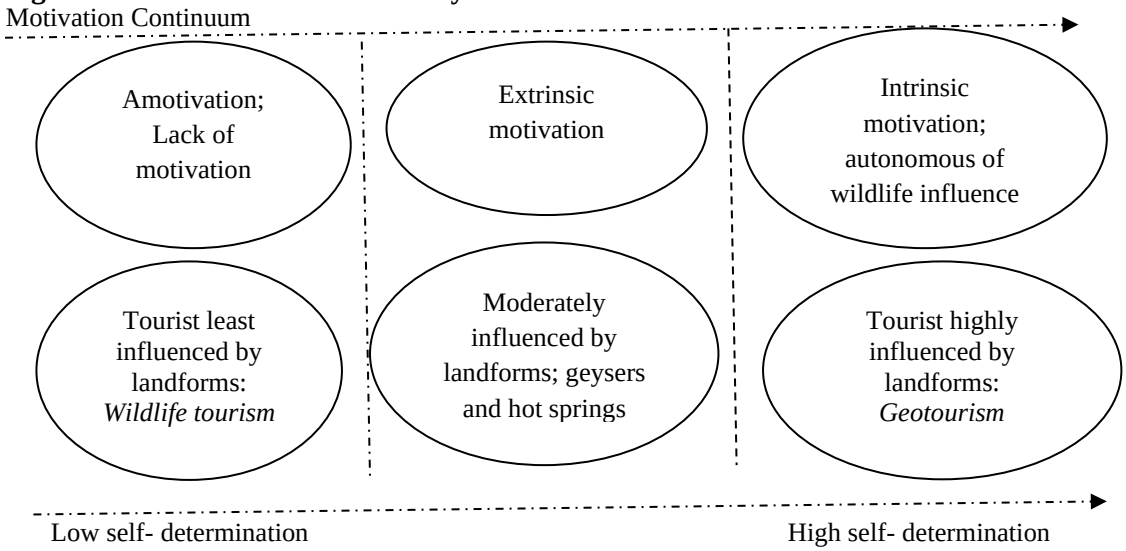
is based on formal knowledge and character of geosite (Daniel, 2001 cited in Tessema *et al*., 2021 pg. 2). Moreover, Vujicic *et al*. (2011) argued that scenic value should be assessed by visitors only to capture the real-time worth of geodiversity sites. Further, the growing interest in geotourism and Global Geoparks prompted UNESCO to set criteria for assessing geodiversity sites and establishing UNESCO Global Geoparks (UNESCO, 2010). This suggests that the growing demand for geotourism has led to the establishment of Geoparks. Reviewed literature indicates that Kenya's National Tourism Strategy has neglected geotourism as a pathway to diversifying tourism (GoK, 2022). Yet elsewhere, this sub-sector is a rapidly growing niche area of tourism, especially in Europe and Asia (Ngwira, 2018; Ólafsdóttir, & Tverijonaite, 2018). Moreover, assessment of tourists' perception of geotourism potential is lacking in the study area, yet there are potential geosites including geysers and hot springs in the study area.

Theoretical Framework

This study adopted the Self-Determination theory (SDT) to distil relationships from the variables in the conceptual framework of this study and contribute to the existing body of knowledge on tourism. The SDT explains how the intrinsic value of landforms influences tourists' visits to their destination. This study examined the influence of landform values on tourism at three levels; (i) a motivation, where wildlife tourism is dominant and landforms have little influence on tourists' perception of destination, and (ii) extrinsic motivation, where both landforms and wildlife affect tourism. Thus, both wildlife tourism and geotourism prevail, and (iii) intrinsic motivation, where landforms have a domineering influence on tourists' perception of destination, which results in geotourism (Fig.1). This study modified the SDT by; first, incorporating the geodiversity component in the motivation of tourism and second, focusing on the influence of tourism motivation on tourists' perception at the destination. The choice of SDT was informed by its suitability to explain and predict causal relationships between study variables; the perceived value of geodiversity and form of tourism - geotourism.

Figure 1: Self-Determination Theory and Motivation of Tourists



Source*: Adapted and modified from Deci, & Ryan (1985, 2006).*

Conceptual Framework

This study conceptualized that tourists' perceived value of geysers and hot springs contributed to geotourism potential and diversification of tourism. Thus, this study used the high geotouristic value of landforms, potential

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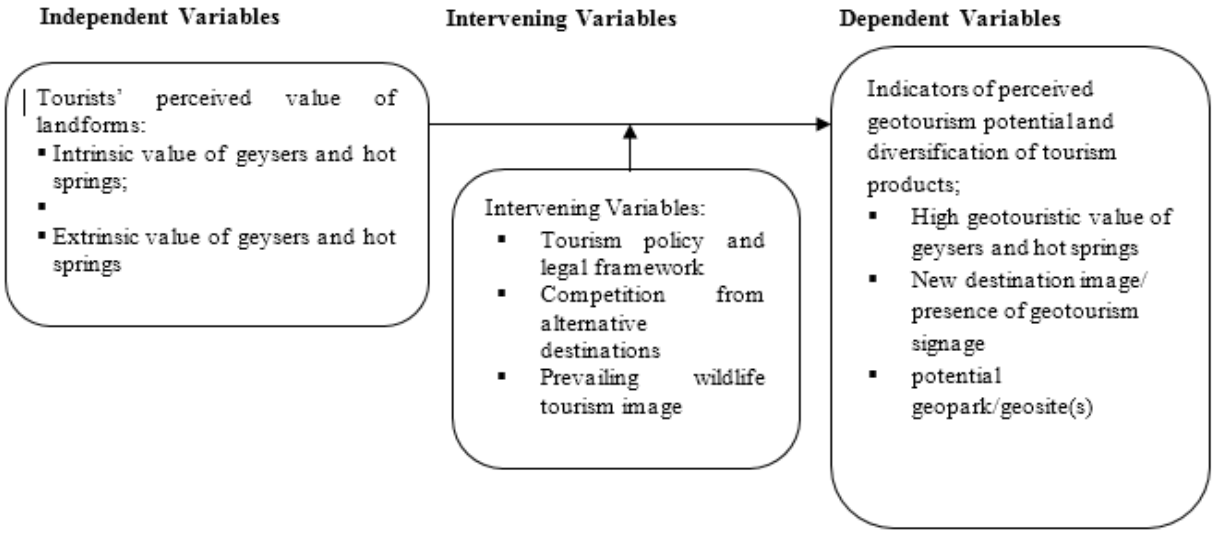
geosites, and signage of geotourism sites as indicators of geotourism potential and tourism diversification in the study area. This suggests that tourists' perceived intrinsic and extrinsic value of geysers and hot springs contributes to a new destination image that is suitable for recognition as a geosite. The parameters of tourists' perceived intrinsic value included; general classification, uniqueness, degree of preservation, observation condition, and availability of information while extrinsic values included; accessibility, security, value of provided services, scenic value, and touristic importance of landforms. Tourists' perception of geotourism potential and diversification of tourism was moderated, mediated and controlled by tourism policy and legal framework, alternative tourism destinations, and wildlife tourism image, which influenced the diversification of tourism in the study area.

Figure 2: Tourists' Perception of Geotourism Potential and its Effects on Tourism Diversification



RESEARCH METHODOLOGY

This study was conducted in Baringo County (Fig. 3), which was characterized by a unique geological landscape due to a variety of geotectonic and volcanic landforms, and geomorphic processes (GoK, 2017b; KNATCOM, 2023). The drainage included Lake Bogoria, which contained the highest concentration of geysers in Africa; at least 18 geysers were found along the bank of the lake and in the lake (GoK, 2017b) that usually erupt up to 5m high. The road network included; Nakuru-Marigat-Kabarnet-Iten and Marigat-Chemolingot trunk road and Karandi-Mochongoi-Marigat, Mogotio-Maji Moto, and Mogotio-Kisanana-Nyalilbuch (GoK, 2017b) feeder roads. The study area has no airport, the nearest being the Eldoret International Airport, which is about 130 km away to the west of Kabarnet town. The study area is endowed with iconic geological formations including the Gregory Rift Valley, geysers, and hot springs yet it has continued to focus on wildlife tourism (GoK, 2017b). This suggests that tourists' perception of geotourism potential was largely neglected in diversifying tourism (KNATCOM, 2023).

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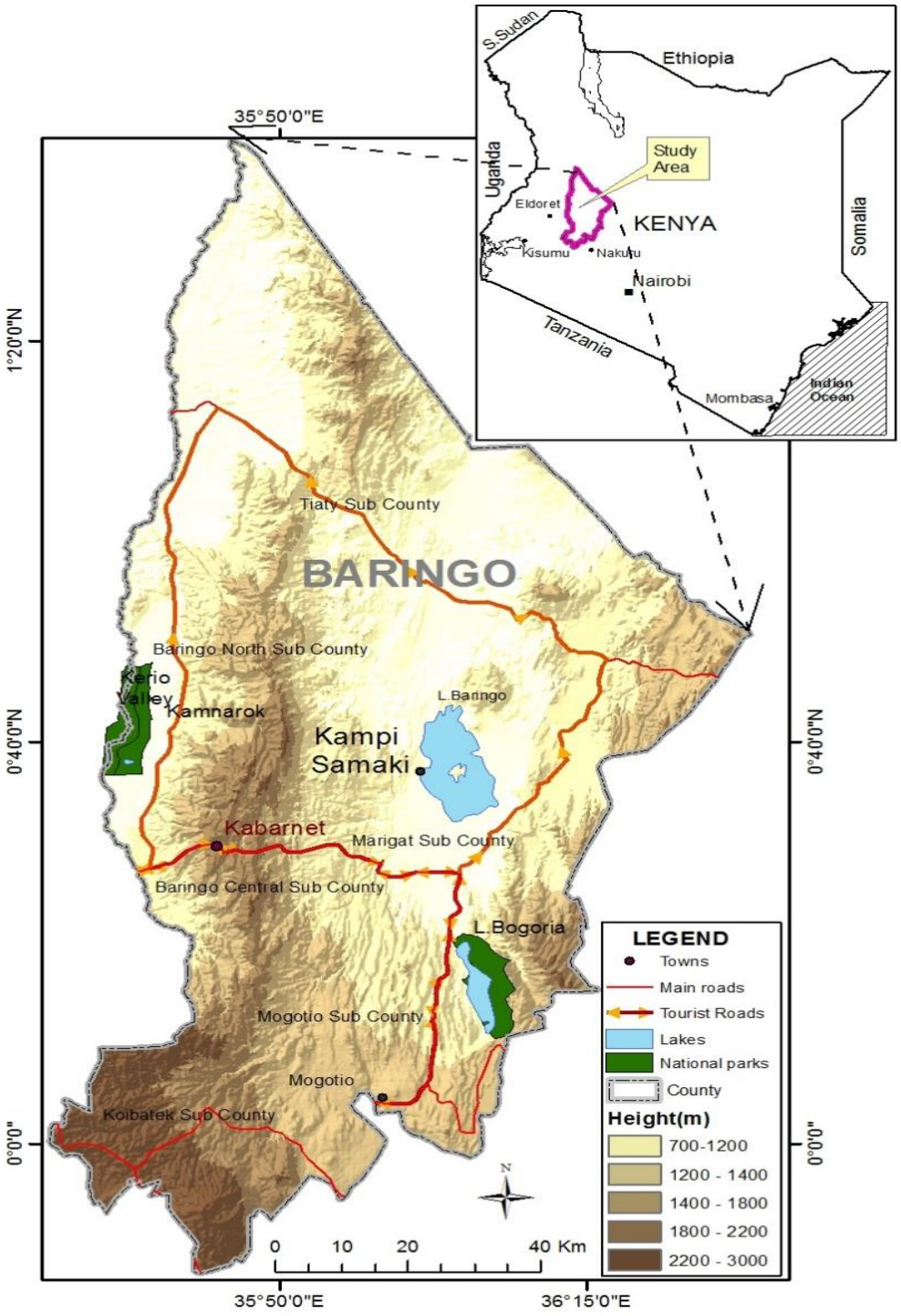
Figure 3: Map of the Study Area



Source: *Kenya Population and Housing Census, (GoK, 2019)*

This study adopted a survey research method and the target population comprised all the tourists aged 18 years and above who visited Lake Bogoria National Reserve (LBNR) at the time of this study. The number of tourists that visited LBNR was 71,400 (GoK, 2017a). Thus, a sample of tourists was purposively selected at LBNR and this study adopted the formula: $n = \frac{z^2 p \times q \times N}{e^2(N-1) + z^2 pq}$ by Kothari (1990) to determine the sample size. Where:

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n – Required sample size

N – Population size – 71, 400 tourists (GoK, 2017a)

p – Population proportion, $p = 0.5$, $q = 1- p = 0.5$

z – Critical z-value at a given significance level, i.e., $z = 1.96$ for a 5 % significance level

e – Acceptable error (degree of accuracy) whose value is 0.05

Substituting these values in the equation, the estimated sample size (n) is given by:

$$n = \frac{(1.96)^2(0.5)(0.5)\times 71{,}400}{(0.05)^2(71{,}400-1)+(1.96)^2(0.5)(0.5)} = 38$$

A purposive sample of 385 tourists who visited LBNR was selected to obtain a perception of tourists who were exposed to geysers and hot springs. To provide experience-based tourists' perceived value of geysers and hot springs, an on-site self-administered standard questionnaire was used to collect quantitative data.

This study modified the value of landforms that constitute tourist attractions into intrinsic and extrinsic values. For each of the dimensions, the modified Strba, & Rybar (2015) method employed a five-point maximum Likert scale to allow sufficient differentiation of tourists' perception of geotourism potential. The modified method ensured the appropriateness of the standard questionnaire in data collection, computation of the geotouristic value of geysers and hot springs, and assessing geotourism potential. A self-administered standard questionnaire was used to collect quantitative data, which was used to measure tourists' perceived value of geotourism potential. Five-point values and totals of intrinsic and extrinsic values were used to generate the tourists' perceived composite value of geysers and hot springs. The intrinsic value score was equally based on five-point criteria, which included; general classification, uniqueness, integrity, tourist observation and information availability. The extrinsic value score was based on five-point criteria, which included; accessibility, security, scenic value, value of provided services, and touristic importance (Table 1).

The overall composite pair value or geodiversity value score (gvs) was expressed as follows; gvs = aggregate intrinsic value score (aiv) /aggregate extrinsic value score (aev). Where; g – geodiversity, v- value, s - score, aiv – aggregate intrinsic value score, and aev – aggregate extrinsic value score, and / - is pair. Aggregated intrinsic value score was expressed as; aiv= gc+u+i+to+ia. Where; aiv- aggregated intrinsic value, gc- general classification, u- uniqueness, i- integrity, to- touristic observation condition, ia- information availability. Aggregated extrinsic value score was expressed as; aev = a+s+sv+vps+ti. Where; aev- aggregated extrinsic value, a- accessibility, s- security, sv- scenic value, vps- value of provided services, ti- touristic importance.

The study used Statistical Package for the Social Sciences for the analysis of data and a modified Strba, & Rybar (2015) scale for the interpretation of the tourists' perceived value of landforms based on intrinsic and extrinsic values and explicated by ten criteria. A five-point Likert scale ranging from 1 (low) to 5 (high), perceived geotourism potential was used to generate data which was analyzed based on the following criteria of intrinsic value; general classification, rarity, degree of preservation, tourists' observation, availability of information while analysis of extrinsic value included; accessibility, security, scenic value, the value of provided services, and touristic importance. Specific values were assigned to each assessment option for a single criterion assessed for intrinsic and extrinsic value, each tourism response was assigned a numerical value on a scale of 1 (low) to 5 (high); where *ordinary is (1); unexpected (2); authentic (3); fascinating (4); iconic (5) (*Table 1).

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Table 1: Criteria for Analysis of the Tourists' Perceived Value of Geysers and Hot Springs

Variable /Concept	Descriptors	Value label	Value Score
Intrinsic value			
Geosite general classification	Suitable for recognition globally	Iconic	5
	Suitable for recognition regionally	Fascinating	4
	Suitable for recognition nationally	Authentic	3
	Suitable for recognition at the county	Unexpected	2
	Locally important for recognition	Ordinary	1
Uniqueness/ rarity	Unique worldwide	Iconic	5
	Unique within continent	Fascinating	4
	Unique at the national level	Authentic	3
	Unique at the county level	Unexpected	2
	Typical for locality	Ordinary	1
Degree of preservation	No destruction	Iconic	5
	Mostly preserved	Fascinating	4
	partial destruction	Authentic	3
	Mostly destructed	Unexpected	2
	Totally destructed	Ordinary	1
Tourists' observations	Excellent	Iconic	5
	Very good	Fascinating	4
	Good	Authentic	3
	Fair	Unexpected	2
	Unsuitable/ poor	Ordinary	1
Availability of information	High-quality information	Iconic	5
	Moderate information	Fascinating	4
	Little information	Authentic	3
	Incomplete information	Unexpected	2
	No information	Ordinary	1
Variable	**Descriptors**	**Value label**	**Value score**
Extrinsic value			
Accessibility	Comfortable/optimal access	Iconic	5
	Highly accessible for most persons	Fascinating	4
	Moderately accessible	Authentic	3
	Low access for different reasons	Unexpected	2
	Inaccessible for different reasons	Ordinary	1
Geosite Security	Surroundings of landform are safe	Iconic	5
	Landform secured by security elements	Fascinating	4
	Dangerous land terrain with warnings	Authentic	3
	Dangerous land terrain without warning	Unexpected	2
	No security elements	Ordinary	1
Scenic value of geosite surroundings	Mountainous landscape; with a great view	Iconic	5
	Plain landscape with a great view	Fascinating	4
	Slope with a great view	Authentic	3
	Landscape with no view	Unexpected	2
	Negative effects of Man-made on the perception of geosite	Ordinary	1
Value of provided services at the site	Study room/ library & labs for research purposes	Iconic	5
	Accommodation and catering	Fascinating	4
	Selling souvenirs, historical objects & books	Authentic	3
	Availability of tour guide	Unexpected	2
	Object with services	Ordinary	1

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Variable /Concept	Descriptors	Value label	Value Score
Intrinsic value			
Touristic importance	Marked on touristic maps and connected to cultural features	Iconic	5
	Partially connected to cultural/ historical monuments		
	Visited by holidaymakers	Fascinating	4
	Along the road serving other attractions visited by tourists	Authentic	3
		Unexpected	2
	No touristic importance	Ordinary	1

The key to aggregate value score

$5 \times 1 = 5$ (low)

$5 \times 3 = 15$ (Average)

$5 \times 5 = 25$ (High)

The perceived geotouristic value score of landforms was measured and expressed as a pair value of numbers derived from aggregated intrinsic and extrinsic score values, expressed as; gvs = aiv/aev. The maximum value score is 25/25 for each dimension when analysed on all the five criteria on a maximum 5-point rate; (intrinsic 5×5= 25/extrinsic 5×5= 25 hence 25/25) and the minimum is 5/5 for intrinsic and extrinsic respectively. The higher the composite value, the higher the geotouristic value and the lower the composite value the lower the geotouristic value of the geodiversity site. A pair value of numbers close to 25 indicated a high geotouristic value and vice versa. The composite value that is high and closely paired indicates a geodiversity site having exceptional geotouristic value and vice versa. Further, a composite value score of 25/5 meant that geysers and hot springs had a high intrinsic value but a low extrinsic value. Inversely, a composite value score of 5/25 meant that the geysers and hot springs had low intrinsic value but high extrinsic value. In both cases, it implies that geysers and hot springs had low geotouristic value.

RESULTS

This study presents results on tourists' perception of the intrinsic, and extrinsic value of geysers and hot springs as well as on overall tourists' perceived geotourism potential of geysers and hot springs in the study area.

Tourists' Perceived Intrinsic Value of Geysers and Hot Springs

A total of 385 tourists expressed their perceptions of the intrinsic value of geysers and hot springs on the basis of the following indicators: general classification, uniqueness, degree of preservation, observation condition, and availability of information using a five-point Likert scale. The tourists rated intrinsic value as: *ordinary* (O=1), *unexpected* (U=2), *authentic* (A=3), *fascinating* (F=4), or *iconic* (I=5). Table 2 summarizes the percentage frequency distribution response by tourists on perceived intrinsic value for each of the indicators of geysers and hot springs.

Table 2: Tourists' Perceived Intrinsic Mean Value Score of Geysers and Hot Springs

Indicators of intrinsic value of geysers and hot springs	Response (%)					Mean value score	Std. dev.
	O	U	A	F	I		
General classification	1.8	2.1	1.8	23.9	70.4	4.59	0.789
Uniqueness/landform character	2.1	1.3	11.2	14.8	70.6	4.51	0.896
Availability of information	0.5	3.6	6.0	37.7	52.2	4.37	0.797
Degree of preservation	0.3	1.8	8.1	42.6	47.3	4.35	0.728
Observation condition	0.3	0.0	1.6	98.2	0.0	3.98	0.196
The overall intrinsic mean value						**4.36**	

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In Table 2 the letters O, U, A, F and I refer to tourists' ratings of the intrinsic value of geysers and hot springs as; ordinary (O), *unexpected* (U), *authentic* (A), *fascinating* (F), and *iconic* (I).

According to the results (Table 2), general classification was the highest perceived intrinsic value score (4.59) indicating that iconic geysers and hot springs. And observation condition was the least perceived intrinsic mean value score (3.98). Tourists also, highly rated uniqueness (4.51) and availability of information (4.37) as iconic and fascinating, respectively. The overall perceived mean intrinsic mean value score was 4.36 indicating that overall perceived intrinsic image was fascinating. The majority of tourists (70.6 %) considered geysers and hot springs within Lake Bogoria as globally unique while 70.4 % perceived the general classification of geysers and hot springs as iconic. Furthermore, 47.3 % of tourists perceived the degree of preservation as iconic. The majority of the tourists (98.2 %) perceived the observation condition of the geosite as fascinating.

Explaining the least perceived intrinsic value score of geysers and hot springs at Lake Bogoria, a key informant pointed out the following:

> *"Poor observation condition was due to rise in lake water levels in the past few years that have adversely affected geysers along the shores of the lake, as nearly all of them were submerged, thereby making it difficult for tourists to observe the intermittent gushing of water from the geysers. The geysers that are left are on higher ground along the shore and have little water gushing. There is very little that can be done to restore the submerged geysers and so the disappointment by tourists will continue to persist" In addition, the KI observed that; "The rise on water levels in LBNR had destroyed vegetation along the lake shore. Thus, negatively affecting perception of the tourist destination" (Personal communication with Senior Warden, March 19th, 2022 at LBNR).*

Plate 1 shows the effects of the rise in water levels on vegetation at Loboi gate in LBNR.

Plate 1: The Effects of Rise in Water Levels on Vegetation at Loboi Gate in LBNR.

To elaborate on the tourists' perception of the geysers and hot springs, this study aggregated the individual value scores for the five intrinsic indicators into an intrinsic value score (reliability coefficient, $\alpha = 0.600$) ranging from 5 (low intrinsic value) to 25 (high intrinsic value)[1]. The

[1] $5 \times 1 = 5$ (low)
$5 \times 3 = 15$ (Average)
$5 \times 5 = 25$ (High)

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intrinsic value score was transformed into three ordinal levels; 5-11 (low), 12-18 (average), and 19-25 (high). The higher the value score, the higher the level of intrinsic geosite value and the lower the value score, the lower the level of intrinsic geosite value. Table 3 summarizes the aggregate intrinsic value score levels for geysers and hot springs.

Table 3: **Aggregated Intrinsic Value Score Levels for Geysers and Hot Springs**

Levels	Ordinal Level Scale	Frequency	%
Low	5-11	2	0.5
Average	12-18	33	8.6
High	19-25	350	90.9
Intrinsic mean value score	21.79±2.208		
Total		**385**	**100.0**

Table 3 indicates that the aggregated intrinsic mean value score was 21.79±2.208 suggesting high intrinsic value. The majority of the tourists (90.9 %) perceived that geysers and hot springs had a high intrinsic value level, which is important for creating geotourism products.

Tourists' Perceived Extrinsic Value of Geysers and Hot Springs

The sampled respondents expressed their perception of the extrinsic value of geysers and hot springs on the basis of the following indicators; accessibility, security, scenic value, value of provided services, and touristic importance using a five-point Likert scale. The tourists rated extrinsic value as; *ordinary* (O = 1), *unexpected* (U = 2), *authentic* (A = 3), *fascinating* (F = 4), or *iconic* (I = 5) in response to each item. The results for each indicator are presented in Table 4.

Table 4: Response Rate on Extrinsic Score Value of Geysers

Indicators of extrinsic value of geysers and hot springs	Response (%)					Mean value score	Std. dev.
	O	U	A	F	I		
Security	8.6	0.0	16.4	0.0	75.1	4.58	0.720
Accessibility	1.6	1.3	0.3	33.5	63.4	4.56	0.872
Touristic importance	1.3	18.4	12.7	0.0	67.5	4.46	0.835
Scenic value	0.8	2.9	57.4	0.0	39.0	4.35	0.575
Value of provided services	22.6	46.8	1.8	27.0	1.8	2.39	1.158
Overall all extrinsic Value						**4.07**	

In Table 4 the letters O, U, A, F and I refer to tourists' ratings of extrinsic value of geysers and hot springs as; *ordinary* (O), *unexpected* (U), *authentic* (A), *fascinating* (F), and *iconic* (I).

Information in Table 4 shows that security was the highest (4.58) perceived extrinsic value indicating iconic safety. However, the value of provided services had the lowest value (2.39) indicating unexpected. Field observations indicated that the destination lacked modern ablution facilities and instead had a pit latrine without; running water and sanitary facilities.

In descending order of ranking, the other extrinsic indicators were; - accessibility (4.56), touristic importance (4.46), and scenic value (4.35). The overall mean value score for all the indicators of extrinsic value was 4.07. Of the five indicators, four of them; security (4.58), accessibility (4.56), touristic importance (4.46), and visual value *(*4.35) were rated above average in mean value. Furthermore, the majority of tourists (75.1 %) perceived security at the destination as iconic. Of the tourists (63.4 %) perceived the accessibility of geysers and hot springs as iconic while 57.4 % perceived the scenic value of the destination as authentic. This study has also indicated that 46.8

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% of tourists considered the value of provided services at the site as unexpected. However, some of the activities like boat riding were not practical due to the high salinity of Lake Bogoria, which corrodes and destroys sailing vessels and endangers the lives of tourists. The surveyed tourists who were dissatisfied made suggestions through open-ended questions on how to improve the value of provided services at the destination. Table 5 summarizes the nature of improvements in the value of provided services.

Table 5: Tourists' Suggestions on Value Addition of Provided Services at LBNR

Nature of improvements	Frequency	Response (%)
Value addition of geotourism products	60	63.8
Adding value to provided services	19	20.2
Site conservation/Geoconservation	15	16.0
Total	**94**	**100.0**

Information in Table 5 shows value addition of geotourism products ranked the highest (63.8 %), followed by the value addition of provided services (20.2 %), and geosite conservation (16 %).

To rank tourists perceived extrinsic indicators of geysers and hot springs, this study aggregated the individual value score for the five indicators into an extrinsic value score (reliability coefficient, $\alpha = 0.576$) ranging from 5 (low extrinsic value) to 25 (high extrinsic value[2]). The value score was transformed into three ordinal categories including; a value score of 5-11 (low), 12-18 (average), and 19-25 (high). The higher the value score, the higher the level of extrinsic geosite value and the lower the value score, the lower the level of extrinsic geosite value. Table 6 summarizes the aggregate extrinsic value score levels.

Table 6: Overall Level of Extrinsic Value of Geysers and Hot Springs

Levels	Ordinal Level Scale	Frequency	%
Low	5-11	1	.3
Average	12-18	63	16.4
High	19-25	321	83.4
aggregated extrinsic score value	20.34±*2.238*		
Total		**385**	**100.0**

Information in Table 6 indicates that the aggregated extrinsic mean value score of geysers and hot springs was high; 20.34±2.238 and the majority of the tourists (83.4 %) perceived that geysers and hot springs had high extrinsic value level (19-25) and considered the geosite iconic and suitable for geotourism.

Overall Tourists' Perceived Geotourism Potential of Geysers and Hot Springs

The overall tourists perceived geotourism potential was measured and expressed as a composite pair value derived from aggregate intrinsic and extrinsic score values. The overall conceptual equation was expressed as; *gvs* = aiv/aev; where the overall *geodiversity* v*alue score* (*gvs*) is a conceptual function of the aggregate intrinsic value score (a*iv*) paired with the aggregate extrinsic value score (aev) (see Table 7).

[2] $5 \times 1 = 5$ (low)
$5 \times 3 = 15$ (Average)
$5 \times 5 = 25$ (High)

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Table 7: Tourists Perceived Overall Geodiversity Value Score at LBNR

		Overall level of intrinsic value			The overall level of extrinsic value			Overall level of geodiversity value score		
		Ordinal Level Scale	frequency	%	Ordinal Level Scale	Frequency	%	Ordinal Level Scale	frequency	%
Levels	Low	5-11	2	0.5	5-11	1	0.3	5-11	1	0.3
	Average	12-18	33	8.6	12-18	63	16.4	12-18	22	5.7
	High	19-25	350	90.9	19-25	321	83.4	19-25	362	94.00
Aggregate mean score value			**21.79**			**20.34**			**(22/20)**	
Total			**385**	**100**		**385**	**100**		**385**	**100**

Information in Table 7 shows that the overall level of geodiversity value score (gvs) was 22/20, suggesting high intrinsic value (22) and extrinsic value (20), respectively. This indicates that the geosite had a high and closely paired (22/20) geotouristic value score for both intrinsic and extrinsic values. The results indicate that the geosite was iconic and had universal geotourism potential useful for growing geotourism and diversifying tourism. The majority of tourists (94 %) considered that the destination had high geotouristic value, which indicated it was iconic and of universal value to tourists. Thus, suitable for recognition globally as a geosite by UNESCO.

DISCUSSION

This study found that tourists highly valued the general classification and safety of geysers and hot springs in the study area. At the same time, observation condition and value of provided services were the least perceived intrinsic and extrinsic indicators of geysers and hot springs respectively. Some geosite indicators were highly rated and others least rated, whereas the overall tourists' perceived geotouristic value; intrinsic and extrinsic, of geysers and hot springs was high and closely paired.

The main finding on tourists' perceived intrinsic value shows that the general classification of geysers and hot springs was iconic and of universal value. This is a demonstration that the destination merits recognition globally as a geosite of international value. In support of this finding, UNESCO (2019) argues that Aspiring Global geoparks and geosites must be sites and landscapes of international geological significance. To this extent, geysers and hot springs should be protected under national legislation and the UNESCO Global Geopark Mandate. However, there is a setback to this requirement since Kenya's National Tourism Strategy (GoK, 2022) does not recognize geotourism and Global Geoparks. This suggests the Ministry of Tourism and Wildlife has a weak tourism policy on geotourism and Global Geoparks, which is a hindrance to UNESCO Global Geopark validation and granting of Global Geopark membership status to the study area.

Moreover, this study found that the observation conditions of geysers and hot springs were the least perceived indicator of intrinsic value. This suggests that the tourists were dissatisfied with the attractiveness and conservation status of geysers and hot springs. The adverse effects on geysers and hot springs were due to anthropogenic and natural causes such as pollution and rise in water level, respectively. This was despite the study area already benefiting from conservation status as a National Reserve; - LBNR. This suggests that there was a weak link between geoconservation and growing geotourism in the study area. To prevent inappropriate waste disposal and damage to sensitive geosites due to uncontrolled access, destination managers ought to sensitize tourists on compliance with conservation access. In support of the finding on the necessity of conservation, several other studies have found that destination conservation is especially lacking in developing countries, where priority is given to economic development (Kiernan, 2013) while UNESCO (2019) argue that geosites should be granted conservation status to; prevent misuse and

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damage, ensure maintenance and cleaning, and protect fragile geosites.

The finding on tourists' perceived extrinsic value of landforms indicates that security ranked the highest indicator, and the majority of tourists perceived security as iconic and its surroundings safe for tourists. This finding concurs with the results of a study by Strba (2018) indicating that tourists' safety had a bearing on the choice of destinations. Thus, tourists highly value safety whenever considering where to visit. Since the results indicated that the most important extrinsic factor that influenced tourists' visits was safety, it suggests that safety is crucial in growing geotourism.

The extrinsic value of provided services at Lake Bogoria was ranked the least. The only available service to tourists was tour guides by non-professional guides and this was unexpected for tourists. This indicates that the study area had low-value services, which did not meet the expectations and interests of tourists. This study established that Lake Bogoria lacked standardized amenities such as toilets. This finding is an exception to past studies by USAID (2013) which asserted that quality toilets, enabled Kenya to build an image of a safe and hygienic destination in the international marketplace. However, this finding on the quality of toilets at Lake Bogoria corroborates the results of a study by Jangra *et al*. (2021) which asserted that the availability of public toilets was a big problem at tourist destinations, especially in India. This suggests that destination managers need to add value to tourism products and services to capture the expectations and interests of tourists. According to Gnanapala (2015), tourists are willing to pay for the value-added products and services that make the destination attractive and appealing to them.

The key finding in this study shows that geysers and hot springs had a high geodiversity value score (gvs=22/20); indicating that their geotouristic value is iconic and suitable for growing geotourism. Unlike past studies (Kubalikova, 2013; Strba, & Rybar, 2015; Strba *et al*., (2018) conducted in Slovakia, which involved expert-based practitioners and research scientists, this study used an experienced approach involving tourists who visited geysers and hot springs in the study area. This study demonstrates that tourists can objectively assess geotouristic value of landforms, establish geotourism potential, and explain why tourists attach value to geodiversity sites and by what value (high geotouristic value 22/20).

Further, the high extrinsic value implies that the destination had infrastructure; security, road, signage, and information that supports the demand for geotourism. This suggests that wildlife did not influence the intrinsic motivation of tourists to visit the study area. This suggests that the geysers and hot springs presented an opportunity to grow geotourism and diversify tourism. This finding concurs with the results of a study by Neches (2013) that the success of geotourism depends on both intrinsic and extrinsic elements of a destination.

CONCLUSION AND RECOMMENDATIONS

The objective of this study was to assess tourists' perceived geotourism potential. The key findings of this study are as follows; first, tourists recorded a high geotouristic value (22/20) of geysers and hot springs, which indicates the universal value of the destination and suitability for geotourism. Second, geysers and hot springs were perceived as iconic and suitable for recognition globally as an attraction of universal value – geosite. Third, geysers and hot springs provide opportunities for growing geotourism as a pathway to diversifying tourism in the designated study area – Baringo County. Based on these findings the paper makes the following conclusions and recommendations: UNESCO Global Geoparks and Baringo County government should recognize geysers and hot springs as universal geosites for establishing Global Geoparks as well as promoting geotourism as a pathway to diversifying tourism. The success of this will benefit from the unity of purpose among the key stakeholders, and a revisit to the policy framework especially as it affects geotourism. Additionally, geotourism is a

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relatively new area of research and therefore not enough is known about it. Future research is recommended to provide deeper insights and guidance necessary to grow the sub-sector for instance apart from the geysers and hot springs, there is a lack of comprehensive information on the potential of geosites and geotourism in the study area. The Ministry of Tourism and Wildlife should actively engage in implementing the New Tourism Strategy to support the entrenchment of UNESCO's efforts to establish Global Geoparks as well as grow geotourism in the study area.

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