

Doctoral (PhD) Dissertation

**Leanard Otworu Juma
GÖDÖLLŐ
2023**



**HUNGARIAN UNIVERSITY OF
AGRICULTURE AND LIFE SCIENCES**

**NATURE INTERPRETATION AND WILDLIFE
VIEWERS' BEHAVIOUR REGULATION AT MASAI
MARA NATIONAL RESERVE, KENYA**

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**Leanard Otwori Juma
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Hungarian University of Agriculture and Life Sciences

The PhD. School

Name: Doctoral School of Economics and Regional Sciences

Discipline: Regional Sciences-Tourism Management

Head: Prof. LAKNER, ZOLTÁN
Head Doctoral School of Economics and Regional Sciences
Hungarian University of Agriculture and Life Sciences

Supervisor: Dr. ANIKO KHADEMI-VIDRA
Associate Professor
Institute of Rural Development and Sustainable Economy
Hungarian University of Agriculture and Life Sciences

.....
Approval of the Head of Doctoral School

.....
Approval of Supervisor

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DECLARATION

This doctoral dissertation is original work. It has not been presented for examination in any other university. This dissertation may NOT be reproduced in part or whole without the author's permission of the Hungarian University of Agriculture and Life Sciences.

Name of PhD candidate: Leanard Otworu Juma

Signature:

Date:

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LIST OF ABBREVIATIONS

CGN	County Government of Narok
H_0 (-)	Null hypothesis (number)
IBA	Important Bird Area
KENPRO	Kenya Projects Organisation
Km (s)	Kilometre (s)
KTB	Kenya Tourist Board
KWS	Kenya Wildlife Service
MMNR	Masai Mara National Reserve
MMWCA	Masai Mara Wildlife Conservancies Association
n	Sample size
N	Total population
NI	Nature Interpretation
p	Confidence interval
Q_{\square} KII_{\square}	Questionnaire item (number), Key informant interview (number)
q	Error margin
QR-code	Quick Response code
SRS	Simple Random Sampling
UNWTO	United Nations World Tourism Organisation
VMS	Visitor Management Strategies
χ^2	<i>Chi-Square</i>

DEFINITION OF OPERATIONAL TERMS

An **attitude** is an inclination to respond favourably or un-favourably to objects (Fishbein & Ajzen, 2010), in this case, types of NI as visitor management strategies (VMS).

Nature Interpretation (NI) explains and communicates the significance, meaning, and value of natural elements such as landscapes, wildlife, geology, and cultural heritage to visitors (Ham & Sandberg, 2012; Haring, 2014). The goal is to enhance visitors' understanding, enjoyment, and appreciation of the natural environment and its cultural heritage and foster responsible and sustainable tourism practices. This can be achieved through various methods such as tour guiding services, guided walks, ranger talks, exhibits, display boards and attraction labels, maps, orientation signage, visitor codes, audio-visual presentations, and hands-on activities.

Visitors include all persons entering MMNR for leisure, recreation, or holiday. In the context of this research it includes, tour guides, tourists, and excursionists.

Self-drive visitors refer to tourists and excursionists into MMNR with own or private vehicle or on self-drive car hire and thus instead of being driven around by driver guides, they drive their vehicles by themselves.

Visitor management constitutes all the efforts and initiatives geared at ensuring that visitors achieve high-quality experiences while at the same time supporting the conservation objectives of an attraction (McArthur & Hall, 1998; Van der Donk, 2014)

Wildlife viewers, in the context of this research, the game was synonymous with wild animals. Therefore, wildlife viewing refers to driving through a wilderness conservation area to view wild animals. As tour guides drive specialised tour vehicles through the conservation area, tourists have the opportunity to view wildlife with occasional disembarking at designated locations. Tourists and tour driver guides were collectively considered game-drive participants in this context.

CHAPTER 1: INTRODUCTION

Chapter Overview

This chapter delimits the study giving background information, scope, objectives, hypotheses, significance, and assumptions for the research.

1.1 Background of the Study

It has been argued that tourism and conservation areas have intimately been related for centuries. Driving, walking or travelling to experience nature-based attractions has continuously been a vital component of the operations of nature-based destinations over the years (Eagles et al., 2014). Research carried out in Germany's Jasmund National Park established that nature-based tourism is among the rapidly growing segments in new tourism markets (Raasch, 2004). Tourism in conservation areas heavily depends on the quality of the in-situ cultural and natural resources. Consequently, all stakeholders should carefully direct, mitigate, and manage these heavy visitation impacts for sustainability if possible. Van der Donk (2014), Duro and Joao Carneiro (2017), and Albrecht (2017), define visitor management as the summation of all practices and programs implemented to ensure visitors realise quality experiences. These initiatives are implemented while concurrently supporting the achievement of a destination area's aggregate conservation objectives. The definition above evokes three essential elements of visitor management. That is, safeguarding and augmenting the resource, helping guests enjoy their visit, and; sustaining and expanding the economic benefits tourism can bring.

Besides, research carried out in Australia by Eagles et al., (2014) supports the opinion that Nature Interpretation (NI) can be used as a non-obtrusive visitor management strategy (VMS). Ham & Sandberg (2012), and Ham et al., (2008), assert that NI, as a VMS, chooses and delivers messages while appreciating its impact on protected areas and visitors. Indeed, NI is provided through personal and non-personal forms like tour guiding services, maps, and orientation signage. NI, therefore, has been defined as an educational activity that endeavours to reveal meanings and interrelationships through objects, firsthand experiences, or illustrative media rather than merely communicating factual information (Tilden, 1977; as cited in Juma, 2016; Albrecht, 2017). This research appreciates that regardless of the type or form, NI as a strategy assists visitor management at the site level because "...it represents a link between the resources and the visitors. Secondly, it makes areas accessible and delivers insights to visitors about the place' (Raasch, 2004) while acknowledging the stakeholders involved (Hovardas, Togridou, & Pantis, 2011; Carvalho et al., 2015).

Past research reveals an increasing demand for guiding services and educational information at interpretation centres (Edinburgh et al., 2008; Goh & Rosilawati, 2014; Jaafar et al., 2013; Zuliskandar, 2017). Indeed, positive attitudes amongst visitors and interpretative service providers (tour guides and managers) are critical for NI as a VMS. In research carried out at Mombasa marine park and reserve in Kenya, NI was identified as a tool that can influence resource users' behaviour, thereby affecting the sustainable management of marine resources (Haring, 2014). Further to these, the Nairobi Safari Walk, for instance, stands out as one of the supreme nature-based tourism and conservation education facility in Kenya, with diverse and detailed interpretive services (Kenya Tourist Board (KTB), 2012).

Contrary to the above arguments, other attraction sites and museums utilise freelance and trainee step-on guides that are poorly regulated, with little attention given to their professional skills and competencies (Akama & Kemboi, 2002; Sterry, 2000; Sitati & Ipara, 2012). Further, Ikiara & Okech (2002) identified inadequate nature and cultural interpretation of nature tourist attractions as some of the challenges facing Kenya's nature-based tourism. In this regard, environmental regulations are either ignored or implemented through inappropriate strategies. This unfortunate scenario has also been replicated in Nigeria (Adeola & Aderemi (2016). Indeed, Edinburgh et al. (2008) observe that ad hoc approaches drive interpretative services considerably in some nature conservation areas. This observation acknowledges that interpretative services are unplanned or lack adequate emphasis by the relevant stakeholders in some conservation areas.

1.2 Statement of the Problem

Masai Mara National Reserve (MMNR) is one of Kenya's well-kept secrets and one of Africa's most famous national reserves and, indeed, the world. The rolling savanna grasslands receive regular rainfall that supports large herds and diverse herbivore species, predators, and birdlife. As a biodiversity hotspot, MMNR is famous for wildlife tourism activities like wildlife viewings, balloon safaris, camping, and birding, among others. Indeed, there is increased demand for nature-based tourism destinations like MMNR, which receives hundreds of thousands of visitors annually. During the annual wildebeest migration and high tourist season, many tourists and visitors flock to the MMNR and expose the entire protected area, posing higher risks of negative impacts. In 2018, MMNR received 291241 visitors and about 62,719 tour jeeps ferrying the tourists (County Government of Narok (CGN), 2020). This coupled with the fact that MMNR allows close interaction of wildlife viewers and nature using *safari* vehicles, portends the challenge of adverse impacts that threaten the sustainability of the very natural resources upon which tourism depends, even though high visitation presents an opportunity for revenue generation. This scenario presents

a visitor management dilemma to balance between meeting visitor needs and satisfaction versus conservation objectives instead of focusing only on the economic returns.

Nature-based tourism stakeholders have touted NI as one of the best non-obtrusive on-site behaviour-regulating visitor management strategies. However, inadequate and inconsistent implementation of this strategy can render it ineffective, especially amongst its direct users: visitors, tour guides, and relevant visitor managers. Furthermore, NI is rarely monitored and evaluated for effectiveness (Wolf et al., 2019). In this case, the expansive MMNR, with over 1510 km² and a strained patrolling workforce to enforce compliance, NI is left to regulate wildlife viewers' behaviour through private sector driver guides, visitor codes, and orientation signage. The issue becomes more complex as the application of NI as a VMS is implemented by many stakeholders, each having different objectives and priorities. While the CGN is keen on sustainable tourism utilisation while conserving the reserve, private-sector tourism operators are interested in customer satisfaction and revenue generation.

Further, earlier scholars have observed inadequate interpretation of natural tourist attractions as a challenge to Kenya's tourism industry (Akama & Kemboi, 2002; Kabii et al., 2017; Kabii, Wandaka, & Jilo, 2019). Besides, unregulated freelance tour guides with wanting competencies compound the situation (Kabii, Wandaka, & Jilo, 2019; Nguya et al., 2021). The question, therefore, was as to whether NI regulates visitor behaviour or not. In this regard, using NI as a strategy becomes a challenge that should be surmounted to achieve the desired visitor behaviour and management objectives at MMNR. Therefore, this study sought to evaluate NI as a visitor behaviour regulation and management strategy among wildlife viewers in MMNR.

1.3 Research Objectives to Achieve

The general objective of this study was to assess NI as a behaviour regulatory VMS in wildlife tourism destinations, the case of wildlife viewers in Masai Mara National Reserve, Kenya.

1.3.1 Specific Objectives of Study

The specific objectives of the research were to:

- 1) Establish the extent to which demographic characteristics of wildlife viewers affect the behaviour exhibited at MMNR, Kenya.
- 2) Determine how tour guiding delivery affects the behaviour exhibited by wildlife viewers and what thematic areas should be included in developing a new training curriculum for tour guides at MMNR, Kenya.
- 3) Find out how non-personal forms of NI affect the behaviour exhibited by wildlife viewers at MMNR, Kenya.

- 4) Establish the observable wildlife viewing behaviour patterns exhibited by tourists and driver guides at MMNR.

1.3.2 Specific Research Questions

This study sought to answer the following research questions: -

- 1) To what extent do the demographic characteristics of wildlife viewers affect the behaviour exhibited at MMNR, Kenya?
- 2) (a) How does tour guiding delivery affect the behaviour of wildlife viewers?
(b) What thematic areas should be included in a new training curriculum for tour guides at MMNR, Kenya?
- 3) How do non-personal forms of NI affect the behaviour exhibited by wildlife viewers at MMNR, Kenya?
- 4) What are the observable wildlife viewing behaviour patterns exhibited by tourists and driver guides at MMNR?

1.3.3 Research Hypotheses and Conceptual framework

The conceptual framework shown in Figure 1.1 illustrates the demographic characteristics of wildlife viewers and types of NI as independent factors. Attitude formation and manifested behaviour characterise behaviour regulation. The study investigated the resultant intentions and behaviour using a survey and observation. The premise of this research was that tour guiding services, maps, orientation signage, and visitor codes were the objects that influenced participants' attitudes during wildlife viewing. Consequently, the resultant behaviour satisfies or supports conservation or defies conservation initiatives. The study, therefore, sought to test four research hypotheses, as detailed below.

Hypothesis one: Demographic characteristics of wildlife viewers do not affect the behaviour exhibited at MMNR, Kenya

The study postulated that nationality, age, level of education, and purpose of visit, herein described as demographics, shape the cognitive and affective domains of attitudes and, eventually, the behavioural domain of wildlife viewers' attitudes. Age, education level, and visit purpose imply knowledge and experience and thus shape attitudes on the attitude object: NI and the behaviour exhibited. These demographic characteristics of visitors make the foundation for destination visitor profiling crucial for designing appropriate visitor management and marketing strategies. Thus, Ho1 stated that the demographic factors of wildlife viewers do not affect the behaviour exhibited at MMNR, Kenya.

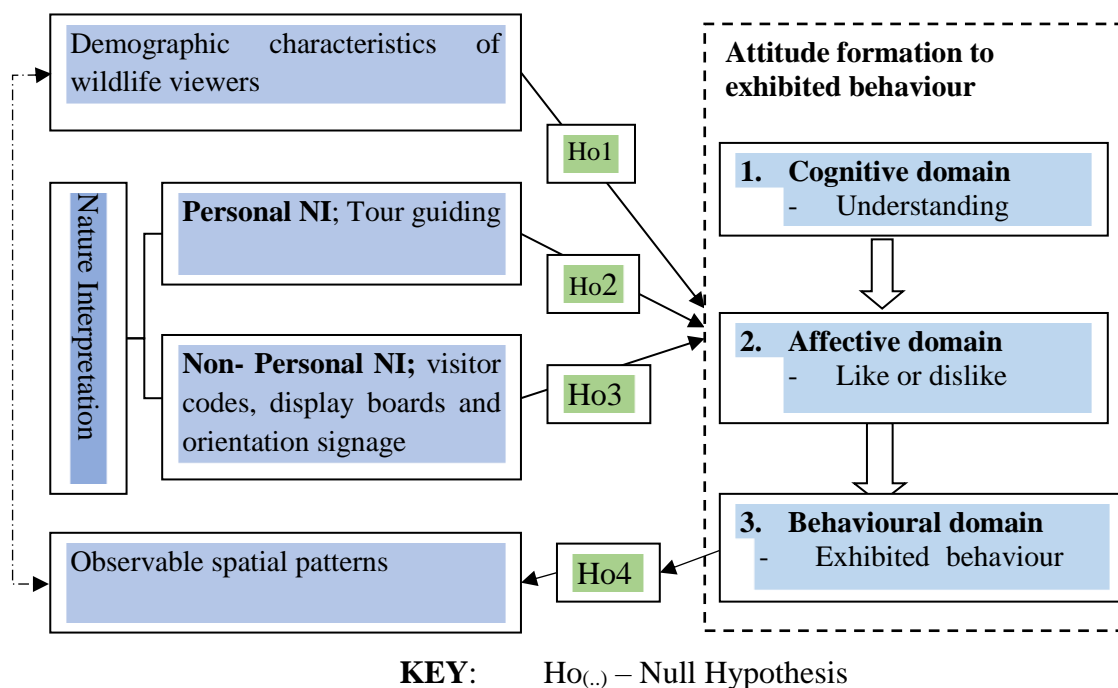


Figure 1.1: Conceptual Framework Source: Reviewed literature & Researcher (2020)

Hypothesis Two: Tour guiding delivery does not affect the behaviour exhibited by wildlife viewers, and consequently, there is need to develop a new training curriculum for tour guides at MMNR, Kenya.

The study presumed that based on wildlife viewers' evaluation of tour guiding as a personal interpretation technique, it is possible to outline a tour guide training program to respond to visitor needs and redesign new approaches in visitor management for MMNR. This hypothesis was based on the assumption that competent tour guides would effectively provide NI to the satisfaction of wildlife viewers. Therefore, tour guides in MMNR might not require retraining to enhance their skills. On the other hand, tour guides without a comprehensive NI training background, experience, or competencies are not envisaged to provide a satisfactory experience to wildlife viewers. Therefore, in this regard, if tour guiding execution and their competencies affect wildlife viewers' behaviour, the null hypothesis was to be rejected. Alternatively, the null hypothesis would not be rejected if tour guiding did not affect participants' behaviour in wildlife viewing. The study further deduced that if NI through tour guiding affected wildlife viewers' behaviour, no considerations should be made to develop an appropriate curriculum for training tour guides at MMNR.

Hypothesis Three: Non-personal forms of NI do not affect the behaviour exhibited by wildlife viewers at MMNR, Kenya.

This study submitted that non-personal forms of NI, such as visitor codes, information centres, display boards, and orientation signage, can shape and affect wildlife viewers' behaviour while

engaging in wildlife viewing activities at MMNR. The study considered this relationship critical, positive or negative, as it impacts the strategies to enhance these non-personal forms of NI. Understanding this relationship was vital in shaping favourable behaviour and providing a framework for evaluating future non-personal forms of NI. A relationship that will also guide the redesigning, positioning, or quantity of non-personal forms of NIs and provide considerations on how best to supplement the dissemination of NI information through these media. On the contrary, if there is no relationship, the study should propose other strategies to solicit positive behaviour for wildlife viewers (tourists/ visitors and tour driver guides). Therefore, the third null hypothesis for the study stated that non-personal forms of NI do not affect the behaviour exhibited by wildlife viewers at MMNR, Kenya.

Hypothesis Four: Tourists and driver guides exhibit no spatial wildlife viewing behaviour patterns at MMNR.

The study postulated that NI affects the spatial wildlife viewing behaviour patterns amongst tourists and tour guides as a persuasive form of communication. The soft NI strategies (like tour guiding, visitor codes, information centres, display boards, and orientation signage) supplement traditional hard visitor management strategies like ranger vehicle patrols for enforcing compliance, trail closures, penalty fees, bans, and other hard VMS. The study further assumed that if conventional methods are insufficient, new monitoring techniques for wildlife viewers should be developed to mitigate the potential negative impacts of visitors' acts of omission or commission at specific wildlife locations or situations. In this regard, the fourth null hypothesis stated that the spatial wildlife viewing behaviour patterns exhibited by tourists and driver guides at MMNR are neither affected by NI nor traditional monitoring methods. New strategies for monitoring visitor behaviour would be proposed based on study results on this hypothesis.

1.4 Scope of the Study

The research sought to establish the effect of NI on behaviour regulation in Masai Mara National Reserve, Kenya, as a wildlife tourism destination (See research permit -Appendix V and research authorization Appendix-VI). The study targeted tour guides and visitors participating in wildlife viewings within MMNR, an area of 1510 Km², using questionnaires and observations by tracking tour vehicles (Appendices I, II, and IV). Tourism officers involved in visitor management constituted the respondents for qualitative research data through interviews (Appendices III). The study was carried out from November 2020 to February 2021 and mid-June to early September 2021 to account for both the tourist low and high seasons (see Table 4.3).

1.5 Assumptions of the Study

The research assumed that all data and information sought were available and accessible. It further presumed that the data collected was factual and without any prejudice. The study further assumed that the tourism sector would have bounced back from the shocks and challenges presented by the Corona Virus Disease of 2019 (COVID-19) Pandemic.

1.6 Significance of the Study

Findings from the research provided recommendations on improving NI as a tool for behaviour regulation in visitor management in conservation areas. The study provided a gestalt understanding of NI as a destination and VMS, thereby providing a framework for evaluating these strategies on behaviour regulation and achieving the desired management objectives in protected areas.

Managers of nature-based destinations and nature interpreters will use the research findings to appraise the usefulness of their NI services. Also, results from the cumulative mapping of vehicle movements in the MMNR will help proactive management and control and avert potential adverse impacts on the ecosystem. The study also provided an information-sharing framework for collaboration between the private sector stakeholders and the conservation agencies on implementing and enforcing compliance with visitor codes.

The study provides contemporary insights that can help public sector agencies in tourism planning and policy formulation on visitor management through NI. Also, study findings and recommendations will help the CGN re-evaluate its NI initiatives to balance the contradicting conservation versus visitor satisfaction objectives. The study recommended feasible contemporary visitor management strategies within nature-based destinations through NI and embedded object tracking systems. Additionally, enhanced remote visitor vehicle monitoring will minimise the need for actual car patrols in the park. The wildlife viewing zonations and patterns will help in land use planning and zoning. Secondly, it helped target proactive visitor management strategies like site hardening, patrols, and positioning of visitor codes and orientation signage. The study also provided a feedback framework for wildlife viewers to evaluate NI as a behaviour regulation tool in protected areas. Moreover, the study findings added to existing knowledge on applying NI in visitor management through behaviour regulation and provided a foundation for similar investigations.

CHAPTER 2: OVERVIEW OF LITERATURE

Chapter Overview

This chapter gives the background information to the study and positions tourism in the nascent discipline of regional science. It critically reviews relevant literature in the context of the study.

2.1 Tourism and Regional Science

The term tourism has different meanings depending on the objective or perspective of various stakeholders. Tourism scholars, government institutions, industry associations, and private firms have differing definitions reflecting their diverse perceptions and interests (Smith, 1988). Nevertheless, these definitions fall into three broad classifications; demand or supply-side or a combination of both. In this case, studying the consumer, the personal and macro characteristics of where they travel from, their needs, and wants that require satiation from travel and tourism represent the demand side of tourism. On the other hand, the supply side is represented by all the destinations and institutions, both public and private, that attract and host travellers by satisfying their needs and wants through the goods and services provided.

Some scholars have defined tourism as the practice of people travelling to and residing in areas beyond their natural environment for a duration not exceeding one consecutive year for recreation, business, and other purposes (Leiper, 1979; Page, 1994; Sharpley, 2009; Michael, Hall & Page, 2010; Fletcher, Fyall, Gilbert, & Wanhill, 2018; Fakana & Mengist, 2019). This generic definition that gives both the supply and demand perspectives is one of the oldest, most simplistic, and most widely used. The United Nations World Tourism Organization (UNWTO) has adopted the definition (UNWTO, 2015) as the activity of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business, and other purposes and not less than 24 hours. Generic definitions of tourism elaborate on the link between the tourist or traveller and the industry that serves their needs from the generating regions to the destination areas.

On the other hand, supply-side scholars define tourism as the theory and practice of touring, attracting, accommodating, and entertaining tourists and the business of operating tours (Sayyad & Shinde, 2013). Other scholars observe tourism as a collection of activities, services, and industries that deliver a travel experience comprising transportation, accommodation, eating and drinking establishments, retail shops, entertainment businesses, and other hospitality services provided for individuals travelling away from home (Dayananda & Leelavathi, 2016). In the words of Fletcher, Fyall, Gilbert, & Wanhill (2018) and Gnanapala & Athula (2015), tourism is viewed as the sum of the processes and relationships arising from the interaction of tourists, industry

vendors, host governments, and host societies in the cycle of attracting and welcoming tourists and other guests. Supply-side definitions emphasize more of the tourism industry and its constituent subsectors. Thus the preceding description is one of the widely used and clearly describes the supply components of tourism.

Jafari and Brent Ritchie (1981), as cited in Fletcher, Fyall, and Gilbert (2018), defined tourism as the study of persons away from their usual residence, the industry created to satisfy their needs and the effect that he and the industry have on socio-cultural, economic and physical environments of the host. This definition emphasises the relationship between tourists, the industry, and the environment by the impact generated, whether positive or negative. This definition ignores the travel aspect of tourism, length of stay, and travel purposes, which are critical components of tourism. These arguments notwithstanding, this definition is among the apt descriptions of tourism, especially when studying how tourism relates to destination areas like in the current study.

Despite the varied perspectives, these definitions have some commonality; first, the movement of individuals (tourists) from their places of regular residence to other destinations. Secondly, the interrelationships between tourists' needs and the goods and services provided during their travel, and lastly, the tourism supply sectors, host governments, and communities. In this regard, therefore, this visitor and travel demand to destinations consequently lead to the development of accommodation and catering facilities, activities, attraction and entertainment areas, transport infrastructure and related superstructure, and support services like marketing, banking, insurance, immigration, security and travel organisation among others necessary to service the travel needs of the tourist. These explicitly give tourism the geospatial and economic perspectives while denoting the inherent back-and-forth interrelationships and networks embedded in touristic activities and their location.

From these definitions, it is apparent that tourism involves individuals travelling from a generating area to a destination area, the industry that meets the travellers' needs, and the tourist and the industry's environments. Collectively, these elements denote that tourism runs as a system (Figure 2.1) as postulated by the widely used Leiper's Model (Fletcher et al., 2018; Hall & Page, 2010; Holden & Fennell, 2012; Leiper, 1979; Sharpley, 2009). Tourism also denotes the linkages between tourists-generating regions and destinations as individuals travel for leisure, recreation, holiday, or even business. The tourism supply-supply side constitutes all institutions catering to travellers' needs in transit and destination regions. Leiper's tourism system also appreciates the environments within which tourism operates, which may positively and negatively impact travel and tourism.

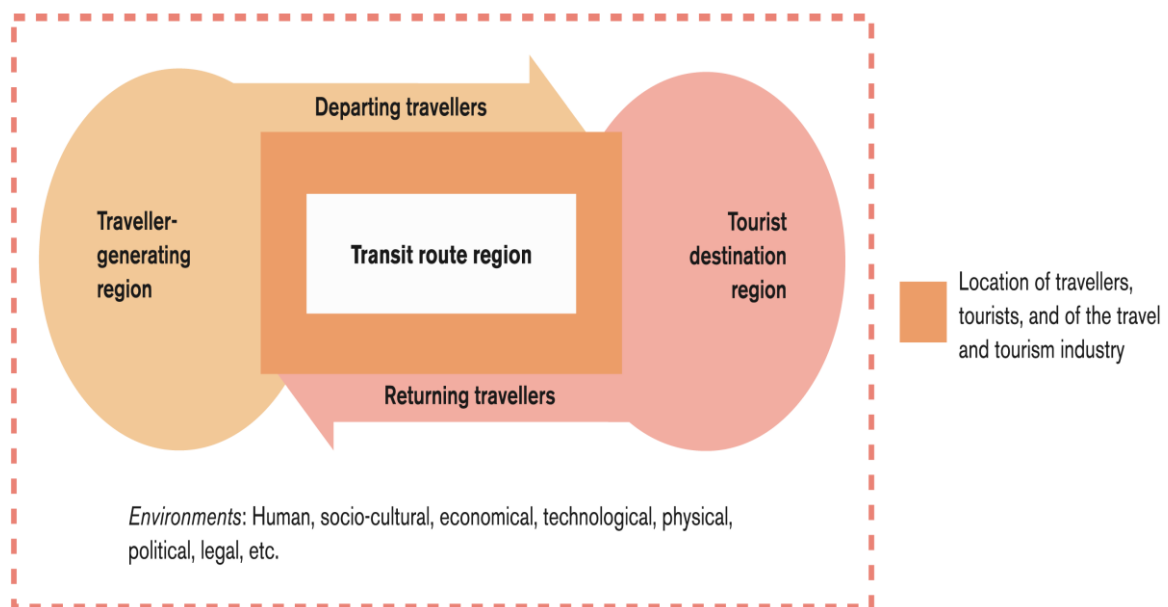


Figure 2.1: Leiper's tourism system as adopted from Goeldner and Ritchie (2009) and Fletcher et al. (2018)

Thus, the tourism industry and its operations are widely referred to as a tourism system because the sectors and actors are interconnected, interrelated, and change over time. The main actors in the tourism system include governments, local host communities, travellers, tourism product suppliers like transportation companies, accommodation, and catering outlets, attraction sites, activity and entertainment spots, shopping facilities, travel organisation companies, support services like insurance, marketing, and financial service providers. The tourism system is considered part of society and the environment. It illuminates the complex nature of the tourism industry and that the various sectors influence each other with back and forward linkages and multiplier effects.

The tourism system is made up of six significant components. These include travellers, tourist-generating regions, destination regions, transit points, and tourism supply sectors that deliver tourism goods and services (Fletcher et al., 2018). Moreover, finally, the socioeconomic, technological, legal, and political contexts within which the system operates (Goeldner & Ritchie, 2009). The spatial aspects in the tourism industry are that there is travel outside the persons' typical environment, whether international, domestic, or same-day travellers or excursionists. Secondly, contemporary tourism has become a way of life in and of the world and navigating ourselves around our complicated world. People and traded products in our globalised world have become objects and agents in motion (Fletcher et al., 2018; Goeldner & Ritchie, 2009; Page, 1994). Travel for tourism is just one part of the broader movements of people and objects. Movements mainly occur during vacation holidays, visiting friends and relatives, pilgrimage, travel for health reasons, business, sports, or educational study.

New technologies in transportation and communication have jointly worked to reduce the apparent distances among communities. These developments have resulted in a ‘time-space convergence,’ thus making the whole wide world village’ (Nijkamp et al., 2015). On the other hand, geographers have emphasised how the environmental, economic, and cultural relationships have been entwined and overextended across the globe. These have made distant destinations become within reach. Indeed, global travel and tourism have led to the dispersion of technologies and information and shared learning, innovations, human resources, people, businesses, and international brands. Furthermore, with enhanced access, demand for tourist destinations will increase. Consequently, companies will shift from general to specialization in niche and new markets to grow their bottom line (Chen & Prebensen, 2017).

On the other hand, as a scientific field of study, regional science addresses the traditional aspects of space in diverse social-science phenomena such as urban and regional growth, socio-economic disparities, or transport logistics (Nijkamp et al., 2015). These spaces include regions, cities, the environment, infrastructure, and communication networks. As an academic discipline, regional science is relatively new and draws from other disciplines, like planning, economics, geography, ecology, political science, and sociology (Nijkamp et al., 2015; Nijkamp & Ratajczak, 2015; Stough et al., 2018). It is an integrated analysis of the sociocultural, political, economic, psychological, and psychical environmental factors affecting a region or a system (Nijkamp & Ratajczak, 2015; Stough et al., 2018). Indeed, like multifaceted tourism, the scholars *ibid* continue to add that regional science recognises that a thorough understanding of the space economy's complexity requires a multi-dimensional analytical approach in which several disciplines are integrated or at least interconnected.

Location and agglomeration theories are critical components of regional science. These theories endeavour to answer why and where economic activities like tourism can be found, the spatial conduct of all agents, and interdependencies, commonly referred to as networks. The spatial aspects of tourism include travel flows and locations, the dispersion of tourism-related developments, land use and use zoning, and changes in the physical environment. Tourism thus becomes a vehicle for transition, an integral part of transitions, and as a result of transition (Muzapu & Sibanda, 2016; UNWTO, 2016; UNWTO, 2015).

Several factors and attributes have made tourism receive this international recognition as a critical regional economic development driver (Republic of Kenya, 2013; Wall, 2018). First and foremost, tourism generates indiscriminate employment opportunities for unskilled, semi-skilled, technical, and managerial levels. Also, the sector provides diverse investment opportunities,

mainly by small and medium-sized enterprises, in addition to attracting ever-growing investment and participation by multinational firms and local companies.

Therefore, for marginalised and least developed regions, the tourism industry can diversify regional economies and revenue streams for host communities and the possibility of resource redistribution from developed to less developed regions through the spread of multinational and multiregional companies (Dunets et al., 2020; Nijkamp et al., 2015). The tourism sector also has robust back-and-forth intersectoral linkages that provide markets for goods and services across other economic sectors (Fletcher et al., 2018). Tourism is the only export where production and consumption occur in the same country while subject to domestic value-added tax (Dunets et al., 2020). Tourist transit corridors and destinations have experienced urbanisation and the development of service centres as the transient visitor community generates seasonal or permanent demand for goods and services. Indeed, it can be argued that tourism catalyzes the growth and development of marginalized regions and their transit areas. Still, on the flip side, however, tourism can also be termed as one of the agents that erode their socio-economic potential.

Space presents tourism economic advantages or disadvantages that are excellent or poor endowments of production factors that significantly impact the situation or location of tourism activity (Nijkamp et al., 2015; Tomassini & Cavagnaro, 2020). These resources endowment, coupled with ease or difficulty accessing the destination, makes some regions have mega, busy, and more appealing destination areas than others. From the perspective of regional science, space in tourism can be equated to a destination, a key area for developing and delivering tourism products. Space is essential for implementing tourism policies and locating tourist facilities, tour circuits, and tourist activities. A destination space also offers a diverse range of interconnected experiences, goods, and services under one destination brand, serviced by private and public sectors. Finally, physical (tangible elements) and intangible (image, identity, personality) aspects are present in a destination space.

However, location theories should have a unique explanation given that most tourism products are mainly services. They are distinct from other tangible commodities where consumption can occur away from production through the distribution processes. Nevertheless, for tourism products, production versus consumption, the product with its producer, is inseparable in time and space (Fletcher et al., 2018). Therefore, services cannot be produced ahead of demand and stored for future use. Another unique characteristic is that tourism services cannot be pre-tested before purchase as services do not have physical traits (Fletcher et al., 2018; Goeldner & Ritchie, 2009; Page, 1994). Examples include transportation, accommodation, travel planning and organisation,

tour guiding services, visitor information, and interpretation, to mention a few. In this regard, the natural resource endowments, physical attributes, tourism facilities, and tourism workforce of destination regions constitute the product and define pricing, image, and character.

Land-use zoning has been applied as a critical instrument in delimiting tourist areas using multiple criteria to establish the most appropriate resource-use solutions. Contemporary approaches propose applying a series of geographic information system (GIS) diagnostic tools and spatial agglomeration-based techniques for analysis (Nijkamp & Ratajczak, 2015; Tomassini & Cavagnaro, 2020). They may also evaluate and explain differences between tourist macro and micro-zones regarding social and economic impacts. Social network analysis processes can determine the network characteristics and the capacity to converge, disperse and transfer tourists and knowledge flow to other verifiers (Sugimoto et al., 2019), in this case, wildlife viewing zones and patterns in the MMNR.

2.2 Tourism and Destination Management

Destination management is complex in theory and practice because there lacks a universally acknowledged definition of a tourist destination. However, scholars have identified three common and recurrent characteristics: a destination consists of diverse attractions, activities, experiences, attributes, goods, and services. Secondly, destinations are linked to different regions, territories, locations, or spaces ranging in size from local to domestic to international, whether the boundaries are fixed or fluid. Lastly, from a demand or supply standpoint in which, the two preceding characteristics are perceived either in terms of the needs, perceptions, or experiences of tourists or in terms of the numerous private sector firms and public sector agencies providing a diverse array of goods and services (Pearce & Schänzel, 2013). Therefore, a tourism destination area is an assemblage of interconnected stakeholders rooted in a physical and socio-economic environment that strives to meet travellers' needs and produce quality experiences for visitors' consumption. It is a basket of goods, services, activities, and experiences in the tourism value chain and the basis of tourism analysis. A destination also has an image and identity that reflect its intangibility and influence its market competitiveness (Albrecht, 2017; Inversini et al., 2014).

On the other hand, destination management is the organised management of the elements that make up a destination environment, namely attractions, services, entry, marketing or image management, human resources, and pricing (Hoan, 2015; Muzapu & Sibanda, 2016). As a strategic approach, destination management links up these distinct entities for superior command of the tourist region. This management helps circumvent the replication of marketing, training, human resource development, visitor services, business support initiatives, and addressing identified gaps.

In this regard, destination management requires the inclusivity of all public and private stakeholders to work together to deliver an appealing tourist destination and experience.

The tourism destination consists of a collection of facilities and amenities, which have many multi-dimensional qualities like every other consumer good (Hoan, 2015; Mawioo & Kagiri, 2015). On the other hand, Inversini et al. (2014) view destinations as a mix of tourism items that provide visitors with an integrated experience. In line with earlier views, it is prudent to describe a destination as an amalgamation of goods and services provided at a single location that can attract tourists outside its geographical limits. Presenza et al. (2005) argue that a destination is a blend of goods, services, and natural and artificial pull factors that draw tourists to a location.

Therefore, the spatial location becomes just one factor that makes up a destination. Thus, on the flip side, a destination can be defined as the tourism supply system for goods and services to satiate the needs of travellers and as the spatial location where tourism demand meets the tourism supply (Ali and Obaid, 2014; Risteskia et al., 2012). A tourist destination has spatial and administrative limits that define its management, images, and perceptions central to its market competitiveness. A geospatial space where visitors spend at least one overnight stay. It includes tourism products such as support services, tourist resources, and attractions within one day's return journey.

Furthermore, tourist destinations integrate multiple partners that usually include the host population and layer up and network to make broader destinations regions (Tomassini & Cavagnaro, 2020). Therefore, in this regard, tourist destinations could be of any scale, ranging from a country, region, island, town or city, village, or self-contained centres (also referred to as tourist enclaves). The viewpoints mentioned above notwithstanding, it can be concluded that a destination, and indeed destination management, is complex, involves diverse stakeholder clusters, and must address multiple interests. The current study was to be carried out at the MMNR as a tourist destination area and sought to evaluate the efficacy of NI services as VMS for behaviour regulation.

2.3 The call for Visitor Management and the place of NI

Over the years, the UNWTO has reported and projected sustained and fast tourism growth globally (UNWTO, 2016, UNWTO, 2017, UNWTO, 2018; Muzapu & Sibanda, 2016). This tourism growth trend has been replicated and reported worldwide in most regions, destinations, or tourist market segments. For instance, contemporaries in Germany have observed that nature-based tourism is among the fastest-growing market segments (Bhandari, 2014; Raasch, 2004). Similarly, Eagles et al., (2014), Frost, Laing, and Beeton (2014), and Chen and Prebensen (2017), in their research on tourism and conservation areas in East Asia, observed that global travel in the

contemporary marketplace is growing. Besides, they continue to add that; travel is swelling and that holiday travel to nature-based destinations like parks, reserves, and similar conservation areas is also tremendously increasing. In this regard, therefore, as visitor numbers grow, so do the management challenges thereof.

In most situations, the researcher argues that tourists are ignorant that their behaviour might be detrimental to the environment. Actions including casual damage to sensitive areas; exploring areas of sensitive biodiversity; littering; feeding wild animals; moving too close to wild animals (harassment); removal of “souvenir” pieces; making noise; vandalising vegetation and graffiti on-site have significant impacts on the environment (Buckley, Zhong, & Ma, 2017; Chen & Prebensen, 2017; Lee & Jan 2018; Leung et al., 2018; Lóczy & Ciglić, 2018). Unpleasant tourist behaviour may be attributed partly to a lack of visitor management and information provision. Therefore, it calls for careful management of visitor experiences that must minimise harmful impacts at attractions while simultaneously maximising enjoyment, understanding, and appreciation of the resource through satisfactory and suitable access and NI. Whereas this research agrees with the forgoing sentiments, it can also be argued that individuals' socio-cultural or economic backgrounds can also shape their value systems and, consequently, their attitudes towards nature.

Eagles et al. (2014) observe that, in the contemporary world, the overall travel market is not only increasing but vacation travel to national parks and related kinds of nature-based destinations are also increasing and as visitor numbers grow, so do the management challenges. Indeed, the UNWTO (2018) projected that by 2020, international travel would hit the 1.6 billion mark in arrivals. Tourism in a country like Kenya is experiencing a double-digit growth rate in visitor arrivals, out of which 75% of foreign and domestic visitors visit nature-based destinations (Republic of Kenya, 2018). Suppose these statistics are anything to go by, the future of nature-based destinations is gloomy without necessary mitigation measures to manage the potential negative impacts of such high visitation (Borges, 2017; Schwartz et al., 2018). This scenario is against the backdrop that, at times, it is not the visitor numbers but the behaviour or actions of the tourists that pose challenges to conservation and nature-based resources. As mentioned earlier, this research also opines that as much as high visitation automatically presents visitor management challenges, the preexisting knowledge, culturing or value systems, individuals have also greatly affected visitor behaviour patterns. In this regard, therefore, one group of visitors might act more favourably compared to another.

Visitor management in public spaces by responsible agencies has changed over time. From a philosophy of "let nature take its course" to "leave us alone," in which resource management took precedence over users, to a new way of thinking in which visitors are treated as stakeholders, co-owners of the resource, and valued guests (Timothy & Boyd, 2014). In the infancy stages of visitor management, recreation and tourism scholars accepted the carrying capacity concept from wildlife management. The idea was mainly not about establishing numbers but rather thresholds of optimal use before adverse effects occur (Magayu, 2014; Papilaya et al., 2019; T. H. Yang et al., 2014). However, the carrying capacity concept is questionable because, at times, it is not about numbers. An understanding that uses levels and impacts thereof vary considerably from location to location, season, type of activity, the physical attributes of the area, type of visitors, and social characteristics of the setting must collectively be understood to establish levels of use that are acceptable to the majority (Marschall et al., 2017; Timothy & Boyd, 2014). The preceding notwithstanding, the current research opines that the carrying capacity concept is complex, requires time to monitor and evaluate trends to establish the limits of acceptable change, visitation impacts are cumulative, and a destination deteriorates over time.

On the other hand, Sharpley (2009) asserts that visitor management is a necessary evil. That is, in as much as tourists enjoy the liberties and impulsiveness that holiday affords them to an extent, visitor management imposes some restrictions on that freedom. Although ideally, visitor management should be discreet, non-regulatory, and able to heighten visitor experiences. Reviewed literature emphasises the significance of NI as a VMS employed to attain desired objectives within conservation areas. The ability of interpretation, however, to reduce the impacts of visitors to natural areas has rarely been quantified. Therefore, the current study sought to establish NI's impact in shaping or changing visitor behaviour to achieve the desired visitor management objectives within MMNR.

2.4 Hard and Soft Visitor Management Strategies

Hard visitor management involves direct visitor control and regulation approaches adopted and implemented by destination management companies. Hard visitor management approaches include physical, regulatory, and economic management (Albrecht, 2017; Mason, 2005). Hard VMS are diverse and include hardening or softening visitor trails, restricting visitor, vehicle or equipment entry, ranger patrols and activity monitoring, regulating activity type, activity zoning time and space, differential pricing by time and location, trail closure/relocation, implementing entry or user fees, restrictions or prohibitions, implementing carrying capacity, allowing accredited organizations to bring visitors to the site (Table 2.1 below).

In contrast, soft visitor management approaches involve and indirectly regulate visitors in a more willing and self-engaging manner (Kebete & Wondirad, 2019). Soft or ‘indirect’ management seeks to influence visitor decision processes for appropriate behaviour; this mainly involves providing education and awareness to solicit positive responses amongst visitors through marketing, education, and interpretation (Marschall et al., 2017). Soft strategies employ visitor education and NI, including tour guides, visitor codes, information centres, maps, orientation signage, display boards, diorama, visitor exhibition, and demonstrations (Table 2.1 below). What distinguishes NI from other forms of information transfer is that it aims to translate the technical language and content of natural science and related fields into simple ideas and illustrations that anyone can understand (Van der Merwe et al., 2020).

Table 2.1: Hard versus soft visitor management strategies (VMS)

Scholar	Hard VMS	Soft VMS
Littlefair, (2003)	<ul style="list-style-type: none"> • Site hardening visitor trails • Restricting entry • Ranger patrols and activity monitoring 	<ul style="list-style-type: none"> • Display board with environmental interpretation • Role modelling • Tour guiding
Mason (2005)	<ul style="list-style-type: none"> • Regulating activity type • Tourist use zoning • Differential pricing • Trail closure/relocation 	<ul style="list-style-type: none"> • Providing guides • Maps and orientation signage • Visitor information centres • Visitor codes of conduct
Candrea & Ispas (2009)	<ul style="list-style-type: none"> • Regulating access by area (zoning) • Regulating visitation by visitor type (through pricing) • Implementing entry or user fees • Allowing accredited organizations to bring visitors to the site 	<ul style="list-style-type: none"> • Providing interpretation programmes and facilities • Staff or volunteer guides • Regulating visitor behaviour (codes of conduct)
Zelenka & Kacetl, (2013)	<ul style="list-style-type: none"> • Managed visitor flow at the entry • Maintaining & hardening trails • Suitable routes in terrain • Car parks and related infrastructure • Activity zoning time and space • Pricing policy by time and space • Restrictions/absolute regulation • Implementing carrying capacity 	<ul style="list-style-type: none"> • Signage on tourist trails • Placement & quality of interpretation • Visitor/tourist information centres, • Codes of conduct for visitors, companies & institutions in tourism, • Conservation educational programs and seminars • Visitor information and communication
Eagles et al., (2014)	<ul style="list-style-type: none"> • Pricing by season, location, and visitor type • Enforcement and rules of law • Carrying capacity restrictions • Visitor support infrastructure 	<ul style="list-style-type: none"> • Visitor education and interpretation • Guided walks • Visitor centres • Ranger guides
Timothy & Boyd (2014)	<ul style="list-style-type: none"> • Regulating access by; area zoning, transport, opening or closure, banning prohibited materials like food and plastics • Regulating visitation by; numbers, group size, visitor age or activity 	<ul style="list-style-type: none"> • Regulating behaviour • Providing programs for; interpretation, education

	<ul style="list-style-type: none"> • Regulating equipment; vehicle type, fishing gear, • Site hardening or softening • Use accredited organisations or individuals to bring visitors to a site 	
Petric & Mandic, (2014)	<ul style="list-style-type: none"> • Area zoning • Limiting free access • Concentration or dispersion of tourist flows • Limiting some activities • Spatial planning • Application of eco-certificates • Setting quotas and restricting the size of visitor groups 	<ul style="list-style-type: none"> • Information management • Training of visitor managers and staff • Training and awareness • Conservation education
Leung et al., (2018)	<ul style="list-style-type: none"> • Site hardening • Location and regulating trail usage • Differentiated pricing • Zoning and management of recreation opportunities • Penalties and restricting visitor behaviour • Limiting use, and types of facilities and tourism opportunities • Provide suitable infrastructure 	<ul style="list-style-type: none"> • Provide opportunities for visitors to learn • Education and information programmes • Visitor information centres • Public engagement and visitor education by encouraging their involvement in monitoring • Training stakeholder groups
Benkhard et al. (2018)	<ul style="list-style-type: none"> • Reducing visitor load • Monitoring visitor flow • Protecting values • Avoiding common use conflicts • Financial strategies 	<ul style="list-style-type: none"> • Influencing visitor behaviour • Provision visitor information
Kebete & Wondirad (2019)	<ul style="list-style-type: none"> • Visitors pay to access sites • Imposing restrictions in differing circumstances • Reduce the use of fragile areas • Zoning • Differentiated entry fees by time, activity or visitor type • Ranger patrols and activity monitoring 	<ul style="list-style-type: none"> • Communicating expected behaviour to visitors • Signboards • Brochures and leaflets • Guidebooks and maps • Visitor codes of conduct • Personnel/guides at visitor sites • Segmenting visitors based on their needs, values, and profiles
Van der Merwe et al., (2020)	<ul style="list-style-type: none"> • Visitor trails/pathways • Observation platforms and bird hides • Rules and regulations • Fines and fees 	<ul style="list-style-type: none"> • Audio-visual c commentaries • Brochures • Display boards • Guest information centre exhibition • Staff or volunteer guides

Source: Researcher, (2022) as adopted from literature

Kuo (2017) asserts that behaviour regulation through hard VMS is primarily suitable for short-term results in visitor negative impacts management. However, hard VMS alone might not achieve long-term outcomes because they have obstructive aspects. Scholars support the opinion that conservation education or NI as a soft VMS should be applied to complement hard management strategies (Alazaizeh & Hallo, 2017; Albrecht, 2017; Bhati & Pearce, 2017; Durao & Joao, 2017). As endorsed by other earlier scholars, these researchers observe that NI elaborates the reasons

behind regulatory actions like zone closures or limiting the number of visitors is necessary and, indeed, the implications of inappropriate behaviour (Eagles et al., 2014; Edinborough et al., 2008).

Managers of tourist attractions, destinations, and cultural heritage have various strategies to adopt and adapt to different visitor management scenarios (Jankovic et al., 2017; Muñoz et al., 2019). While strategies in Table 2.1 are all familiar tactics mostly adopted by visitor managers, they are designed mainly for spatial points and areas owing to their complexity and diverse stakeholding and not line attractions like museums (Timothy & Boyd, 2014). Linear attractions start and terminate at different points but may connect to other routes or destinations (Healy et al., 2016). Thus, museums are short-duration transit points or attractions for travellers. This fact notwithstanding, the challenge is to select the elements with higher utility as administrative tools for natural wildlife trails, routes, and other outdoor activities and facilities (Schwartz et al., 2018).

Benkhard et al. (2018) assert that VMS in natural areas are logical if they protect and preserve the area's values, are conveyed well, are acceptable to visitors, and can be regulated and enforced. In addition to increasing awareness of the benefits of NI, it has been concluded that more attention must be placed on informing visitors and implementing measures to enhance compliance (Benkhard et al., 2018). Scholars observe that for these to be practicable, hard and soft visitor management approaches should be integrated into the protected area management plans and diligently implemented for complementarity to optimise the results of VMS (Benkhard et al., 2018; Pearce & Dowling, 2019; Jankovic et al., 2017; Kubo et al., 2019). This study agrees that successful destination management plans must include visitor management and be implemented with a good understanding of the destination's characteristics and appropriate instruments. In this regard, it should integrate strategic, tactical, and operational management of visitor flows, activities, behaviour, methods, and experiences. Thus NI, as a contemporary visitor management technique, can regulate visitor behaviour, influence tourist decisions, reduce visitor environmental impact, and simultaneously enhance visitor satisfaction.

2.5 Nature Interpretation (NI) Techniques/Approaches

2.5.1 Tour Guiding (personal NI)

Tour guiding is a NI technique that involves leading a group of visitors through a natural area and providing them with information and insights about the area's natural and cultural features, as depicted in Figures 2.2 (a), (b), (c), and (d) below. A tour guide is trained to engagingly and interactively communicate the significance and value of the natural and cultural resources to the visitors and enhance their understanding, appreciation, and enjoyment of the environment (Çetinkaya & Öter, 2016; Nejmeddin, 2020; Petric & Mandic, 2014). In addition to good training



(a)



(b)



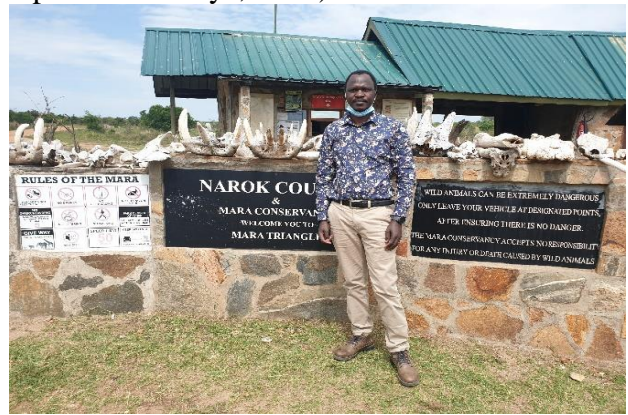
(c)



Figure 2.2: Tour guiding a nature walk (a), Tour driver guide in MMNR (b), Ranger guides at Nairobi National Park (c) (Source: Republic of Kenya, 2019)



(a)



(b)



(c)



(d)

Figure 2.3: (a, b, c, d); Visitor codes, display boards & orientation signage in MMNR (Source: Researcher, 2022)

background in NI, certain characteristics of a tour guide, in particular their confidence, passion, sincerity, and charisma, are also strongly correlated with positive visitor outcomes (Benkhard et al., 2018). Tour guides play several roles in the context of tour leading and NI and include planning and preparing for the tour, including researching and gathering information about the area's natural and cultural features, history, and local customs (Liu et al., 2021). Tour guides ensure the safety and comfort of the visitors, including managing their movements and providing first-aid assistance if necessary (Poudel & Nyaupane, 2013).

Furthermore, they provide contextual and historical background information, such as the area's geology, ecology, and cultural heritage. Tour guides encourage visitors to adopt responsible and sustainable tourism practices, such as staying on designated trails and avoiding disturbing wildlife and plants (Merriman, 2005). They also evaluate and adapt the tour to meet the needs and interests of the visitors. In this regard, tour guiding is an effective NI technique as it allows visitors to experience the natural environment in a structured and meaningful way and provides them with opportunities to ask questions, gain insights, and connect with the environment at a personal level.

Tour guiding as a NI technique has some advantages, including the personal interaction between visitors and a trained guide. Guided tours also provide visitors with a structured experience designed to enhance their understanding, appreciation, and enjoyment of the natural environment. In addition, tour guides ensure the safety of visitors by guiding appropriate actions and behaviours, managing visitor movements, and providing first-aid assistance if necessary. Tour guides also can increase visitors' enjoyment of the natural environment by providing them with new perspectives, insights, and experiences they may not have had otherwise (Poudel & Nyaupane, 2013; Reisinger & Steiner, 2006). Tour guides encourage visitors to adopt responsible and sustainable tourism practices, including staying on designated trails, avoiding disturbing wildlife and plants, and respecting cultural and historical sites (Petric & Mandic, 2014). Furthermore, tour guides can be tailored to meet the specific interests and needs of different visitors, making it a suitable and effective NI technique for a wide range of visitors differing in age, gender, level of education, profession, nationality, of special language requirements.

On the contrary, tour guiding has its set of disadvantages as a NI technique at vast wildlife tourism destinations. Tour guiding may not be possible for visitors who want to venture off the designated trails or enter more remote areas for fear of disturbing wildlife or endangering visitors (Kabii et al., 2017). Secondly, popular wildlife destinations may attract large numbers of visitors, leading to crowded conditions and potentially negatively impacting the environment and wildlife. Tour guiding as an NI technique relies on the availability of trained and knowledgeable guides, which

may be limited at some destinations (Carmody, 2013; Shidende et al., 2019; Topler et al., 2017). Furthermore, tour guides can be expensive, which may limit their accessibility to some visitors. The study agrees that tour guiding is expensive not only to the visitors but also to destination management companies, especially in the high season when demand for tour guides is high. For this reason, destination managers worldwide will opt not to hire more tour guides but encourage a structured approach of engaging volunteer guides or local community guides to circumvent this challenge. Indeed the same arrangement exists in the current study area.

In some situations, tour guides may have a fixed itinerary and schedule, limiting visitors' flexibility to explore and experience the natural environment at their own pace. Tour guiding, especially in large groups, can impact the natural environment by causing erosion, vegetation trampling, and wildlife disturbance. While tour guides provide visitors with information and insights about the natural environment, they may not provide a personal, hands-on experience of the environment, especially in large groups. Despite these disadvantages, tour guiding can still be an effective NI technique for many visitors, especially those new to wildlife tourism or who prefer a structured and guided experience. It is important to balance the benefits and limitations of tour guiding and to implement measures to minimize its impact on the environment and wildlife.

Within the study area, tour guides fall into four distinct categories. First, tour companies employ tour guides to bring visitors into MMNR as tour leaders who constitute the majority. Secondly, resident tour guides are employed in wildlife lodges within and around the MMNR, the second widely used category. Thirdly, volunteer or local community guides are often situated near entry points for hire, mainly by visitors on self-drive if need be. Lastly, there are wildlife rangers employed by MMNR who occasionally double up as tour guides on request or hire at the entry points, and these are the least utilized.

2.5.2 Visitor codes, display boards, and orientation signage

Visitor codes, rules, and regulations are considered a NI technique because they educate and guide visitors about appropriate behaviours and actions when visiting natural areas (Holmes et al., 2016; Merriman, 2005). Visitor codes, display boards, and orientation signage are non-personal NI; once installed, they can self-present to the visitors without requiring personnel. These codes, display boards and orientation signage aim to protect the environment and its cultural and natural resources and ensure visitors' safety and enjoyment (Merriman, 2005). The visitor codes and regulations typically include guidelines such as; staying on designated trails and avoiding disturbing wildlife and plants, not littering or leaving behind waste, and respecting nature, historical sites, and artefacts (Figure 2.3, Appendix-VII, and Appendix-VIII). Others include using low-impact

techniques for outdoor activities such as camping, fishing, and hunting; following fire regulations, such as not building campfires in prohibited areas; adhering to local hunting and fishing regulations. Respecting other visitors' and residents' privacy and rights, among others (Weber et al., 2020). These codes and regulations can be communicated through signs, brochures, maps, and other forms of interpretation, as well as through personal interactions with park rangers, guides, or staff (Figure 2.3).

Visitor codes as a NI technique in vast nature-based tourism destinations have the following advantages. First, they help protect the environment and its cultural and natural resources by educating visitors about appropriate behaviours and actions (Holmes et al., 2016; Merriman, 2005). Secondly, by adhering to visitor codes, visitors can help sustain the natural environment for future generations to enjoy. In addition, visitor codes can help ensure visitors' safety by providing guidelines for appropriate behaviours and actions in the natural environment. Visitor codes also provide a consistent and standardized approach to managing visitors in natural areas, which can benefit park managers, staff, and visitors. Visitor codes can be communicated effectively through signs, brochures, maps, and other forms of interpretation, making them easy for visitors to understand and follow (Ababneh, 2017).

However, visitor codes as a NI technique also have disadvantages. They lack the personal interaction and guidance tour guides or park rangers provide, limiting visitors' understanding and appreciation of the natural environment (Marschall et al., 2017; Petric & Mandic, 2014). Visitor codes provide a standardized approach to managing visitors, which can limit visitors' flexibility to explore and experience the natural environment in a way that is meaningful to them. One big drawback of visitor codes is that they rely on visitors to regulate their behaviours and actions, which may not be effective for all visitors, especially those unfamiliar with the natural environment or who do not understand the importance of protecting it (Holmes et al., 2016; Marschall et al., 2017). And lastly, in some cases, visitor codes may not be effectively enforced, leading to a lack of compliance and potential harm to the environment and wildlife.

In conclusion, visitor codes as a NI technique can effectively educate and guide visitors in vast nature-based tourism destinations. However, the dependence on self-regulation and the lack of personal interaction and enforcement may limit their effectiveness. It is important to consider the advantages and disadvantages of visitor codes in combination with other NI techniques, such as tour guiding and interpretive signage, to provide an integrated and effective approach to managing visitors in the natural environment.

2. 5.3 Visitor information centres

As a NI technique, information centres provide visitors with a centralized location for obtaining information about the natural environment, wildlife, and park activities. Information centres often offer a range of materials such as brochures, maps, and audio-visual displays to educate visitors about the natural environment and its cultural and natural resources (Ababneh, 2017; Amin & Yok, 2015; Moscardo & Pearce, 1986). Information centres are also non-personal NI; once installed, they can self-present to the visitors without requiring personnel. Information centres aim to enhance visitors' experience and understanding of the natural environment and promote conservation by educating visitors about appropriate behaviours and actions. Information centres can also serve as a starting point for visitors, providing them with basic information about the natural area before they venture out on trails or other activities. However, information centres rely on visitors seeking information and may lack the personal interaction and guidance that tour guides or park rangers can provide. It is important to consider information centres as one of several NI techniques used to manage and educate visitors in the natural environment.

As its advantages, information centres provide visitors with a centralized location for obtaining comprehensive information about the natural environment, wildlife, and park activities, which can help enhance their experience and understanding of the reserve (Ababneh, 2017; Amin & Yok, 2015). Typical visitor information centres can be found at the main entry points or other strategically located but mostly staffed locations. Most parks and reserves managed by Kenya Wildlife Service (KWS) (a state agency) have visitor information centres at the main gates. On the other hand, the Ol-Pejeta Conservancy (OPC) in Laikipia county of Kenya has visitor information centres located off the main entry points, at designated areas where visitors disembark from vehicles and have more time to visit the information centres as they view wildlife and relax at the OPC Chimpanzee sanctuary and the OPC Morani education centre (Figure 2.4).

Information centres are also accessible to all visitors regardless of their knowledge or experience, making them an effective tool for educating and informing visitors about the natural environment. Information centres are often located at convenient and accessible locations for visitors to find and use and, consequently, enhance the visitor experience by providing them with information and insights about the natural environment, wildlife, and park activities, helping them to understand better and appreciate the reserve (Kuo, 2017; Mitchell & Ryland, 2020; Moscardo & Pearce, 1986). However, information centres as a NI technique in vast nature reserves have the following disadvantages; limited personal interaction and guidance can be provided by tour guides or park rangers, limiting visitors' understanding and appreciation of the natural environment.

Information centres depend on self-directed learning by visitors to seek out and use the information provided, which may not be effective for all visitors, especially those unfamiliar with the natural environment or who prefer a more structured and guided experience (Kuo, 2017). In some cases, information centres may not be available or accessible in all parts of the reserve, limiting their effectiveness as a NI technique. Lastly, information centres may have a limited ability to adapt to the needs and interests of individual visitors, which can limit their effectiveness.



(a) Game rangers manning the OPC Morani information centre



(b) Inside OPC Morani Information centre (left) Game ranger with young visitors

Figure 2.4: (a and b) Morani information centre, OPC (typical visitor information centre) (Source: Ol Pejeta Conservancy, 2023)

In conclusion, information centres can effectively provide visitors with information and insights about the natural environment in vast nature reserves. However, the dependence on self-directed learning and the lack of personal interaction may limit their effectiveness. It is important to consider the advantages and disadvantages of information centres in combination with other NI techniques, such as tour guiding and visitor codes, to provide a comprehensive and effective approach to managing visitors in the natural environment. They help balance visitors' needs and interests with the conservation and protection of the natural environment, ensuring that the parks and reserves remain intact and accessible for future generations. It is important to continually evaluate and improve these techniques to ensure their effectiveness in promoting conservation and responsible behaviour among visitors.

2.6 NI and Behaviour Regulation

Generally, NI is a communication strategy that simplifies how visitors interact with spatial areas. Indeed, scholars describe NI as an educational activity, a communication process, or a management tool (Ham & Sandberg, 2012). To others as a practice of stimulating and encouraging appreciation (Edinburgh et al., 2008). On the other hand, Tilden (1977), as cited in Raasch (2004), Carranza et al., (2014), and Juma (2016) note that NI is an educational activity that aims to reveal meaning and interrelationships through the use of natural objects, firsthand experiences or by illustrative media, rather than communicating factual information. Tilden (1977) continues to assert that interpretation provokes curiosity and interest. It relates to the everyday experiences of visitors, reveals a memorable message, and addresses the whole story using a unifying theme (Durao & Joao, 2017; Goh & Rosilawati, 2014; Juma, 2016; Leung et al., 2018; Xu & Fox, 2014).

Ceballos-Lascuráin (1996) asserts that not having a NI program in a conservation area is akin to inviting guests into your abode and then vanishing. In this regard, various types of NI make visitors more conscious of the spaces and places they visit (Goh & Rosilawati, 2014; Juma, 2016; Durao & Joao, 2017). Secondly, NI provides information to guests that increase their understanding and consequently stimulate interest, which will result in grander enjoyment and possibly responsible behaviour amongst visitor within the site visited (Olson et al., 1984; Candrea & Ispas, 2009; Hovardas et al., 2011; Xu & Fox, 2014; Albrecht, 2017). Indeed, S. H. Ham & Sandberg (2012) assert that NI successfully provokes individuals to think independently and attach independent meanings to an object or place. It helps shape that person's experience with the object or place if these thoughts are pleasing or gratifying, enhancing their experience. Undeniably, regardless of the type or form, NI, as a visitor management technique, assists in site management. It represents a link between the resources and visitors, makes places accessible, and provides visitors with insights into an area (Raasch, 2004).

Furthermore, NI raises general awareness, supporting resource management policies and agencies. On a similar note, Mason (2005), Alazaizeh and Hallo (2017), Bhati and Pearce (2017), and Albrecht (2017) all affirm that diligent application of NI programs significantly enhances the visitor experiences, thus making the attraction area more competitive. Indeed, NI is not the same as information provision. Whereas the latter provides facts about phenomena, the latter, on the other hand, endeavours to reveal concepts, meanings, and interrelationships among natural phenomena. Therefore, in this regard, NI educates the visitor about his new environment and enhances the experience.

Nonetheless, the values and attitudes of visitors are changing; they now demand more environmentally responsive services and products as well as information (Akama & Kemboi, 2002; Ferrari, 2013). Indeed, Duraó and Joao Carneiro (2017) and Juma (2016) echoed these sentiments. These scholars observed that visitors want to learn about their environment and understand the connections with a broader environment. Secondly, NI can be a strategic tool to intensify conservation awareness and appreciation amongst tourists and site-level tourism operators, depending on these nature conservation areas. Moreover, it can also illustrate how tourists and site-level tourism operators can support the conservation and sustainability of natural and cultural resources they may depend on for non-consumptive utilisation today and in the future.

Studies by Farrell and Marion (2002) and Fung and Jim (2015) identify minimising visitor impacts, evaluation, public involvement, and shared learning as some of the objectives in visitor management through NI. More inclusively, Fung and Jim (2015), MacLeod (2013), and Raasch (2004) support the argument that various types of NI have multiple objectives and benefits for conservation and visitor enjoyment. In other words, different types of NI enhance visitor knowledge and understanding (educational activity), improve visitor experiences (recreational activity), and support conservation.

NI is not always successful. Scholars have identified some reasons why interpretation may not attain its full potential as a tool for visitor management (Bhati & Pearce, 2017; Duraó & Joao, 2017). These notwithstanding, the full potential can only be realised after understanding how to use NI as a tool. Other challenges can present themselves as impediments to achieving these potentials. These include a lack of creativity in implementing NI, a lack of an evaluation culture, and limited training on destination visitor management objectives (Hall & McArthur, 1998). In light of increasingly higher numbers of visitations, UNWTO (2018), Albrecht (2017), Bhati and Pearce (2017), Hovardas et al. (2011), and (van der Donk, 2014) stress that education, interpretation, and information are vital tools used by administrators to manage visitors better. For instance, in Kenya, nature-based tourism, also referred to as wildlife tourism, is the largest segment and accounts for over 90% of nature-based tourism and nearly 75% of aggregate tourism earnings (the Republic of Kenya, 2013, Juma, 2016). In this regard, it has been noted that NI is a component of Kenya's contemporary conservation area management planning (KWS, 2005). Indeed, some types of NI found in Kenya's attraction sites include the printed word (maps, guidebooks, pamphlets), tour guiding services, visitor codes of conduct, and orientation signage. Further to these are interpretative displays (storyboards or audiovisual displays), visitor centres, mechanical or interactive devices, and more (Kenya Tourist Board, 2012).

Unfriendly tourists' behaviour may be credited partly to the lack of visitor management systems and information provided. Visitor experience needs prudent management to reduce harmful impacts at attractions and maximize satisfaction, understanding, and appreciation of the tourist attraction through adequate and appropriate access and visitor codes. Teleological designed signage has proved more effective in managing and changing general visitor behaviour than ontological signage (Jankovic et al., 2017; Marschall et al., 2017). Nevertheless, regardless of the locality or circumstances, visitor codes and signs should meet the language needs of different visitor groups and augment their experiences. Scholars have recommended that the content of NI should include practical information about wildlife protection, take-home messages, and comparisons between wildlife and humans to enable visitors to more readily establish a psychological connection with wildlife (Marschall et al., 2017). While signage has many advantages, other ways of conveying information, such as guided tours with knowledgeable guides, are suggested to supplement signs. Indeed the current study opines that complementarity harnesses the advantages of the various NI approaches

Likewise, Sterry (2000) and Albrecht (2017) assert that NI is a necessary and practical component of a tourism planner's toolkit. A well-designed presented NI is critical in enhancing visitor experiences and satisfaction, mitigating visitor impacts, and encouraging positive nature conservation behaviour. Indeed, conservation education and NI are fundamental tools used by managers in attraction and destination areas to regulate visitors to attractions in a non-intrusive or non-obstructive manner better, thereby reducing negative impacts while increasing the positive effects (Sharpley, 2009; Albrecht, 2017; Buckley et al., 2017; Chen & Prebensen, 2017; Lóczy & Ciglić, 2018; Shackley, 2009).

Fishbein & Ajzen (2010) define an attitude as the tendency to respond to an object with some degree of favorableness or un-favorableness. In other words, attitudes are likes and dislikes or a tendency to react negatively or positively towards a specific person, object, idea, or situation (Jerolmack & Khan, 2014; Sheldon & Fesenmaier, 2017). Jerolmack and Khan (2014) and Snyder and Tormala (2017) assert that attitudes have three components: cognitive, affective, and behavioural. Although most attitudes have all three parts, some are more firmly rooted in the cognitive or affective component. Ordun (2019) endorsed that perceptual, affective, and behavioural evaluations are essential to attitudes. In the current study, NI is envisaged to build on this foundation of attitudes, and cognitive and affective domains, shaping the behaviour. On the other hand, affective domain assessments refer to people's feelings or emotions concerning the object of attitude. Behavioural evaluations refer to people's actions towards the thing on which attitude is directed.

These arguments suggest that attitudes shape people's perceptions of the social and physical world and overtly influence behaviours. Therefore, in the current context, when wildlife viewers interact with different types of NI in MMNR, they develop attitudes. As such, implementers of NI (tour guides and managers of conservation organisations) play a crucial role in providing the stimuli (interpretative services) for attitude formation or change amongst visitors. This research sought to establish how NI can regulate participants' behaviour in wildlife viewing during wildlife viewings in MMNR, Kenya.

2.7 Theoretical Framework

The Elaboration-Likelihood Model (ELM), propounded by Petty and Cacioppo (1986), explains how individuals evaluate the information received. Sometimes a person may assess messages elaborately through critical thinking, while on other occasions, through a more straightforward and less critical manner (Littlejohn & Foss, 2012). Therefore, It is defined as a variable ranging from poor to excellent. Moreover, the likelihood of detailed thoughts on a phenomenon depends on the way an individual process the received message and involves the cognitive (understanding) and affective (emotions) domains of attitudes (Jennings, 2019; Mucha & Halpenny, 2012b, 2012a; Ordun, 2019). ELM studies carried out by Ham and Sandberg (2012) established that an interpretive encounter that provokes more thinking would result in more robust and enduring attitudes. The resultant actioned (exhibited) behaviour serves as the highest level of an attitude. In other words, any communication which successfully provokes an audience into critical thinking stands a better chance of affecting attitudes than communication that does not stimulate thinking. This persuasion theory is relevant to this study as NI; tour guiding services, maps and orientation signage, and visitor codes of conduct are persuasive communication tools.

CHAPTER 3: MATERIALS AND METHODS

Chapter Overview

This chapter describes the study area, research design, target population, sampling procedures, sample size, data collection instruments, validity and reliability of research instruments, data collection procedures, ethical issues, and data curation and analysis procedures.

3.1 Study Area

The section presents the geospatial details of the research study area; MMNR (Figure 3.1 below), Topography, Weather, the local community, the management of MMNR, critical stakeholders to MMNR, attractions, and the visitor traffic of MMNR.

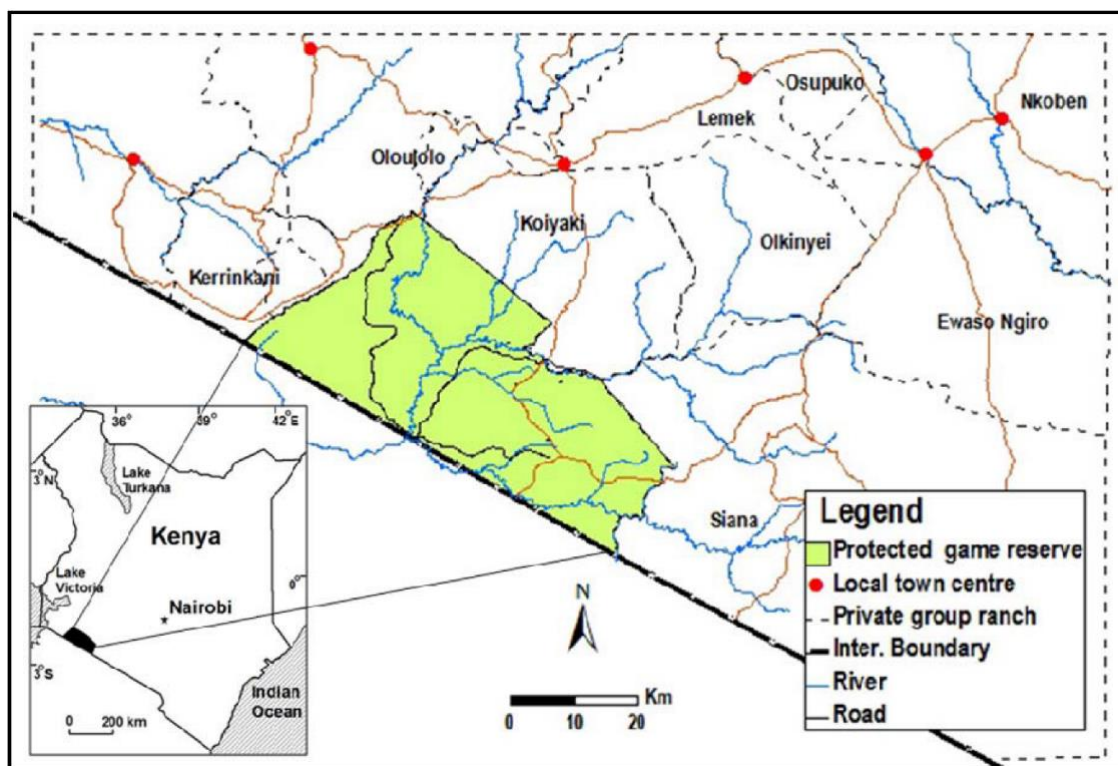


Figure 3.1: Map showing the spatial location of MMNR (Source: CGN, 2020)

3.1.1 Geographical Location and Climate

MMNR covers 1510 km² and is located in the southwestern part of Kenya, bordering Tanzania (Figure 3.1 Above). It borders the Serengeti National Park to the south, the Olololo/Siria escarpment to the west, and community ranches to the north and East. Located within the Great Rift valley floor, MMNR is situated at latitude 1.3719° south of the equator and longitude 34.9381° E. MMNR has an altitude ranging between 1,500 and 1,900 meters. Thus, it has a pleasant climate all year round and a characteristic tropical climate with average temperatures of 26°C. Annual rainfall amounts to about 1,400 millimetres, with April as the wettest month and July as the driest.

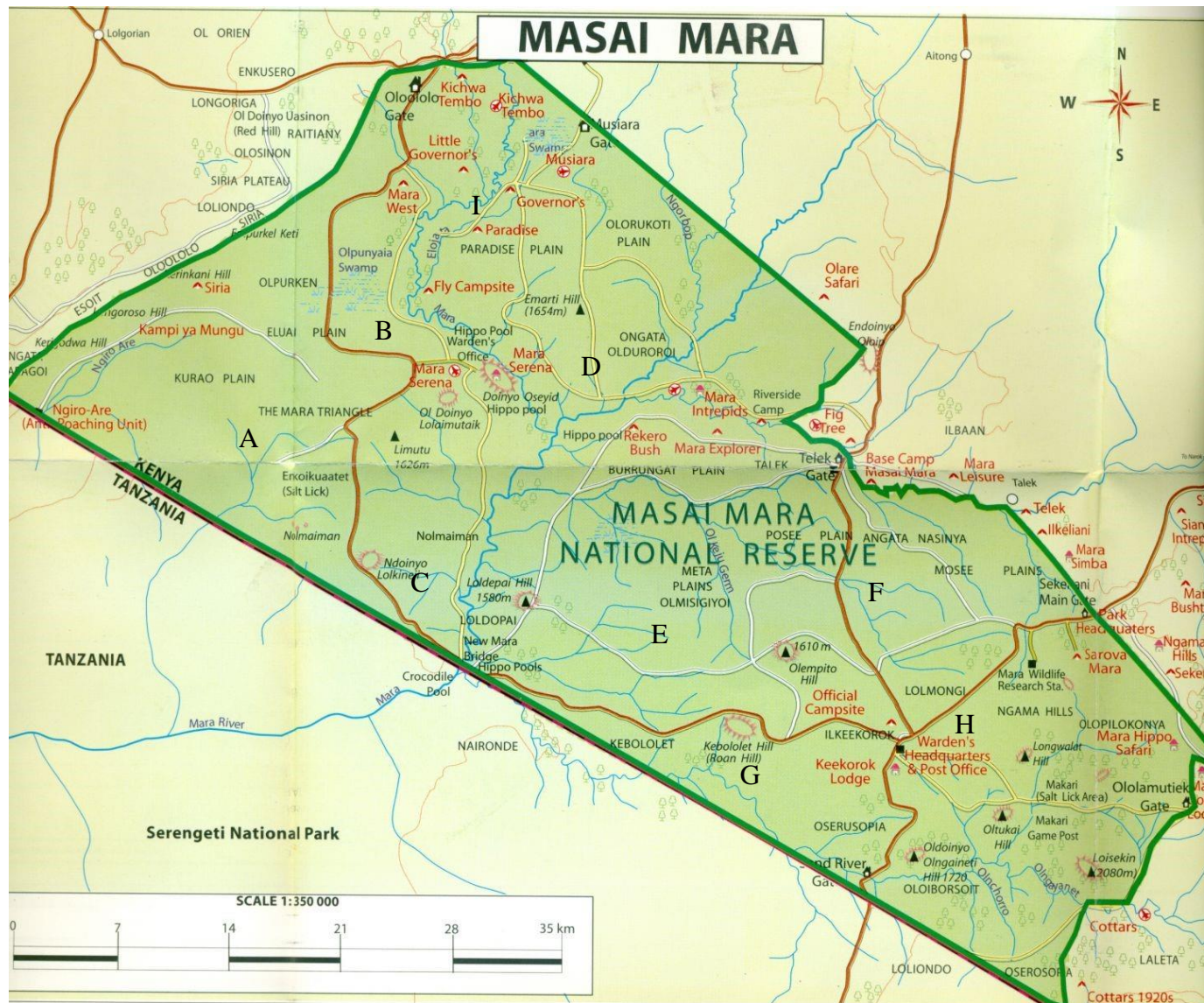
The rolling savanna grasslands receive regular rainfall supporting large and diverse herbivores, predators, and avifauna numbers.

The reserve lies about 265 km from the city of Nairobi via Narok town, which is 105 km away. A tarmac road to this vast, remote wildlife reserve exists up to the main Gate Sekenani (Fig 4.2 below). A network of all-weather roads and wildlife viewing trails, preferably accessed by experienced safari tour guides on four-wheel-drive vehicles, is available within the MMNR. Indeed, visitors require NI and wilderness navigation from professional driver guides to enrich the experience in this expansive and exciting ecosystem. As a far-flung destination, many visitors to the MMNR are rarely day trippers but stay longer than one night because it is a rich biodiversity ecosystem that promises unforgettable experiences. Indeed, MMNR is one of Kenya's well-kept secrets and one of Africa's most famous national reserves and the world. MMNR can also be accessed using the many airstrips in and around the national reserve. These are Mara Serena, Musiara, Ol Kiombo, Keekerok, Mara North, Olare Orok, Naboisho/ Ol Seki, Siana, and Cotter's camp airstrips. (Fig 3.2 and 3.3).

3.1.2 Demographics of the Neighbourhood

The MMNR is located in Narok County, predominantly occupied by the Masai ethnic group, with most of its cosmopolitan townships. CGN is one of the 47 counties established by the Constitution of Kenya 2010, with county headquarters in Narok town. It borders the Republic of Tanzania to the South, Bomet and Nakuru counties to the North, Migori and Kuria counties to the west and Kajiado County to the East. The county has six sub-counties: Mau Forest, Narok North, Narok South, Narok East, Trans Mara West, Trans Mara East, and Narok West, with the latter two hosting the MMNR.

The county covers 17,950 square kilometres and has a total population of 1,157,873, of whom 579,042 and 578,831 were male and female in the 2019 population census. The county's population density of 65 persons per square kilometre (Kenya National Bureau of Statistics, 2019) has one of the lowest Gini coefficients of 31.5 (CGN, 2018), meaning small disparities in income amongst its residents compared to Tana river county, which has the highest (61.7) and the national average of 41.6. A Gini coefficient assesses a country's income and consumption inequality. A coefficient of 0 represents perfect equality, where everyone has the same income, while a coefficient of 100 represents total inequality, where one person gets all the income.



MMNR Spatial Zones

- A Lower Mara triangle and Tanzania border
- B Central Mara triangle -Serena Area
- C Mara Bridge area and border viewpoint
- D Mara Intrepid-Explorer-Rekerero bush
- E Meta plains region
- F Mara Simba to Talek Gate region
- G Keekerok Lodge to Sandriver gate region
- H Keekerok airstrip- Mara Hippo - Sarova region
- I Upper Mara triangle- Governor's camps region

Figure 3.2: Map of MMNR showing the spatial location of tourist facilities (Source: CGN, 2020)

Indeed, Narok County was ranked 7th out of the 47 counties in Kenya and is touted as one of the richest counties by revenue generation and asset capitalization from agriculture and tourism (World Bank, 2018). Disparities in income distribution affect consumption patterns, attitudes, and the extent to which a population is involved in social and economic activities, including tourism. From a policy and planning perspective, income distribution and consumption disparities affect the priorities regional development agenda.

3.1.3 Socio-Economic Activities in and around MMNR

Pastoralism, agricultural farming, tourism, and other small-scale economic activities dominate the county. Residents rely on the county's biological system for agriculture, tourism, water, and more. The MMNR, home to the "Eight Wonder of the World" Great Wildebeest Migration, lies in the county. The study region, MMNR, is one of the major exporters of invisible tourism products to international and domestic markets as visitor traffic from other parts of the globe and Kenya flock to this destination for the annual wildebeest migration. This yearly spectacle, among other inherent characteristics of being an enchanting, tranquil, and secluded destination, MMNR has become one of the most visited and diverse countryside tourism destinations in Kenya after the cities of Nairobi and Mombasa. MMNR has an advanced tourism industrial system with multiple differentiated and quality attractions, accessibility options, ancillary services, activities, and accommodation facilities, giving MMNR territorial competitiveness as a tourist destination.

Maasai Mara is home to around 25 per cent of Kenya's wildlife population. In addition to being an Important Bird Area (IBA) with 550 bird species, it is home to over 95 mammal species. Approximately 70% of this wildlife lives outside the gazetted conservation area -the Maasai Mara National Reserve in the tens of community conservancies (CGN, 2018). These include Olare Motorogi, Olkinyei, Naboisho, Ol Derikesi, Mara North, Lemek, Olchorro Oirouwa, Enonkishu, and Siana Pardamat (Figure 3.3 below). Community-based conservation was founded on the premise that social and economic benefits and community involvement may reduce poverty and enhance human welfare, supporting conservation efforts and lessening threats to biodiversity.

Resource endowments and territorial competitiveness make MMNR a critical economic region in Kenya that should be managed well for long-term regional and national socio-economic sustainability through conservation and tourism. The significance of MMNR calls for multiple approaches to destination management, key among them visitor management through



Figure 3.3: Map showing road network, community ranches and accommodations in and around MMNR (Source: CGN, 2020)

behaviour regulation. This fact forms the motivation behind this research to develop strategies to manage the potential negative impacts of tourist activities in the MMNR. It is vital to note that the MMNR supports thousands of businesses, local communities, and the multiplier effects of visitor expenditure; therefore, sustainable management means sustainable livelihoods and regional economic development.

In MMNR and its environs, pressure for land resources and encroachment on habitats by tourism industry actors are real. Therefore, it justifies the need for strategic destination management to include the tourism industry and visitors' needs. The proliferation of facilities in and around the MMNR is partly a function of tourism growth and transportation improvements. MMNR has tens of airstrips for easy access and is under 100 kilometres from Narok Bomet highway and about 265 kilometres from the capital city of Nairobi. The tarmacking of the Narok to Sekenani main gate and construction of the standard gauge railway to Naivasha and Suswa towns will increase accessibility.

3.1.4 Attractions in and around MMNR

MMNR is one of the major tourist attractions in Kenya, attracting over a quarter of a million tourists every year. MMNR is christened the world's eighth wonder due to the spectacular annual migration of over a million wildebeests. It has been globally acclaimed as one of the most remarkable wildlife destinations in the world. It receives tourists from far and wide to spectate this annual migration. The MMNR has over 400 bird species and several large wildlife ranging from the big five to the unique or ugly five (Mara Conservancy, 2023)(Appendix X). Indeed, the main attractions of the MMNR are the natural endowments around the expansive undulating savannah ecosystem that hosts large mammals and birds, the rivers, and associated ecosystem features (Figure 3.4 a – f below). Masai Mara has become a thriving destination because of several reasons and destination attributes that render it attractive. Unlike other destinations, MMNR boasts high populations and diversity in wildlife species coupled with the seasonal wildebeest migration.

MMNR boasts the third-highest bed capacity in Kenya after Nairobi and Mombasa cities and is the leading attraction by visitation and bed spaces. The uniquely designed accommodation facilities incorporating local culture in design and furnishing are available in and around the reserve for tourists who wish to spend a night or more in MMNR (Figure 3.2 and Figure 3.3 above), totalling over 7000 bed nights (CGN, 2020). Wilderness lodges, and tented camps as manmade attractions, together with a rich Masai culture; dress, music and dance, food and drink, cultural homesteads (manyatta), lifestyle, art, and material craft, attract thousands of tourists during the high season months of July through to early September annually.

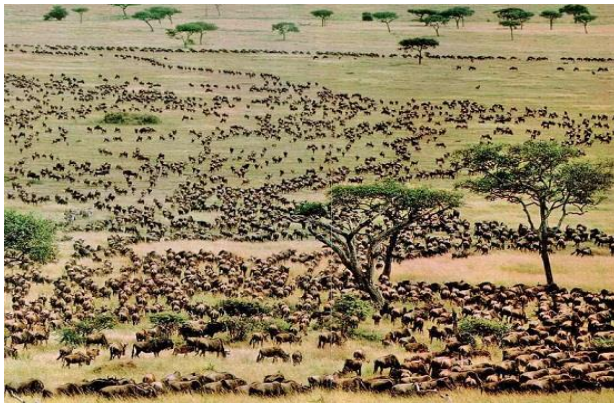


Figure 3.4 (a): The wildebeest Migration



Figure 3.4 (b): Black Rhino sighting



Figure 3.4 (c): Viewing a herd of elephants



Figure 3.4 (d): Photography and filming



Figure 3.4 (e): Tour vehicle Check-in



Figure 3.4 (f): Visitor Check-in



Figure 3.5 (a): Maasai at Sekenani gate



Figure 3.5 (b): Cultural dance at a Manyatta

Source: Researcher, 2022

Apart from wildlife, the larger Masai Mara ecosystem has a rich and living Maasai culture showcased and practised in the cultural manyattas dotted along the reserve boundaries (Figure: 3.5(a) and Figure: 3.5(b)) above. Generally, the words Masai and Maasai refer to the place and

the ‘*maa*’ people, respectively, and are descriptive of the two unique and main attractions of this destination.

3.1.5 Management and Visitation Trends of MMNR

The MMNR was declared a national wildlife reserve in the year 1951. It is administratively divided into the Mara triangle (Appendix IX) and the Keekerok area, managed by the CGN (Appendix VI) with KWS, which only provides wildlife research and management. The CGN manages the ecosystem, infrastructure, revenue collection, access permits, and leases in MMNR. There are designated entry gates and airstrips, with Sekenani being the reserve headquarters and main entry point. The research focused on visitors to the MMNR, Narok county government officers attached to the MMNR, tour guides practising in the MMNR, and other stakeholders that used NI in visitor management.

MMNR is mainly visited by vacation travellers, birders, scientists, educational groups, and occasional business and conference visitors. Indeed, as a biodiversity hotspot, MMNR is famous for nature-based tourism activities like wildlife viewings, balloon safaris, camping, and birding, among others. MMNR is one of the most visited reserves in Kenya; for instance, in 2018, it received over 291241 visitors (as shown in Table 3.1 below) and a total of about 62,719 safaris (tour) jeeps carrying them (CGN, 2020; CGN, 2018)

Table 3.1: Monthly visitor arrivals into MMNR for the period 2018-2019

Month	Jan.	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Year												
2018	9396	11870	12836	9031	10969	26409	54365	59974	28003	3009	14458	30697
2019	13775	15963	9124	11190	7929							

Source: (CGN, 2020)

Despite the available visitation data being scanty, the current study endeavoured to analyse visitation trends and profiled visitors by nationality, gender, age, and purpose. These months guided data collection between the high and low seasons. It was also important to note that some locations in MMNR, like river crossing points and migration corridors for the wildebeests along the Mara and Sand rivers, usually attracted visitor traffic for wildlife viewings. These locations were targeted for observational data collection.

3.2 Research Philosophy

Two philosophies are commonly used in the social sciences; positivism and interpretivism (Moñivas et al., 2005; Babbie, 2016; Khanna, 2019; Hathcoat et al., 2019). Positivism proposes the existence of a coherent and consistent reality in the universe. That reality is observable, measurable, and can be described objectively, ignoring the context or logical evaluation (Babbie,

2016; Hathcoat et al., 2019). On the other hand, the researcher is claimed to be part of the study for interpretivism. The researcher interprets research data and is never entirely objective in this regard. Human interest is integrated into a study, and different people subjectively interpret reality differently (Hathcoat et al., 2019).

The current study was based on the positivist approach to social research. This paradigm was adopted because the study employed mixed methods, both quantitative and qualitative research approaches. The ontological underpinning of this paradigm is that the researcher and reality are separate entities and that objectivity exists beyond the human mind. This connotation implies a lack of bias and, therefore, objectivity. Indeed, according to McBride et al., (2019) and Tonon (2019), mixed methods research produces rigorous and credible data and results. Besides, according to the positivism paradigm, a survey was used to collect data because reality is measurable. Quantitative data thereof were analysed using statistics. On the other hand, qualitative data from interviews and questionnaires were analysed qualitatively using content analysis. The study used content analysis to explore qualitative data from interviews, all in line with the tenets of the positivist paradigm.

3.3 Research Design

The research design refers to the conceptual structure within which research is conducted; it constitutes the blueprint for collecting, measuring, and analysing data (Khanna, 2019). This research adopted an explanatory and mixed-method design (Babbie, 2016; Creswell & Poth, 2018; Tonon, 2019). This design involved sequentially collecting quantitative data and then collecting qualitative data that helped explain findings from the data collected in the first phase. Mixed methods research is widely acknowledged and is increasingly gaining popularity as a vehicle for understanding complex research problems in contemporaries (Babbie, 2016; Creswell & Poth, 2018; Tonon, 2019) and, similarly, the current study.

The core of explanatory research design integrates the comprehensive and contextual assessments of qualitative research with the quantitative generalisations of studying larger populations, yielding more rigorous and credible data. Several scholars have used the explanatory research design in visitor management research within nature conservation areas (Mucha & Halpenny, 2012b, 2012a; Shoji et al., 2008). For example, Mucha and Halpenny (2012b) outlined some techniques used in data collection: on-site surveys, trail cameras, counters, Geographic Information Systems, Global Positioning Systems, interviews, and focus group discussions. Similarly, this research used quantitative data from questionnaires and later qualitative data using interviews to validate the quantitative results.

3.4 Study Population and Sample Size Determination

A target population refers to the entire mass of observations, the parent group from which a sample is established (McBride et al., 2019). This study targeted stakeholders directly involved in visitor management through various types of NI in MMNR. These stakeholders included all visitors to the MMNR, tour guides, and interpreters who actively provide nature interpretative services. Lastly, all managers within MMNR use NI in visitor management.

Data collection was done over seven months to cover the low and high tourism seasons in the MMNR. The low and shoulder visitor season months of November and December 2020 and January 2021 were targeted first, and after that, the high season months from July to September 2021. MMNR received an average of 11376 guests per month (CGN, 2020), a statistic that served as the baseline data for the visitors. It gave a study population of about 79632 visitors during the seven months of data collection. On the other hand, an average of 5227 tourist vehicles flocked into the MMNR every month (CGN, 2020) and, therefore, *ceteris paribus*, a total of 36589 (5227*7) tourism vehicles. However, it was estimated that tour drivers made 3.8 trips to the MMNR each month, giving 26.6 visits during the seven-month study period. Thus, 1373 tour drivers (36589/26.6) constituted the second transient study population because most tour driver guides made several repeat visits to the MMNR.

The sample size denotes the number of items/respondents selected from the target population to constitute a sample (Taherdoost, 2016; Tonon, 2019). The study had a total of 388 vehicle tracking observation checklists and 570 questionnaire respondents; 413 visitors, 157 tour guides (randomly sampled) using the Krejcie and Morgan (1970) formulae as cited in Kenya Projects Organisation (KENPRO), 2012), and nine (9) Visitor managers purposively sampled (Table 3.2).

$$n = \frac{x^2 NP (1-P)}{d^2(N-1)+x^2 P(1-P)}$$

Where:

- n - the desired minimum sample size,
- x^2 - the table value of the *chi-square* for 1 degree of freedom at the desired confidence level (3.841 or 1.96²),
- d - the acceptable range of error (0.05)
- N - the proportion of visitors/tour guides or vehicles participating in wildlife viewing over the six months the research was carried out (50%)
- p - the proportion of potential wildlife viewers who do not participate in the research for the rest of the year = 1- p (50%).

Hence; $d = 0.05$, $p = 0.5$, $x^2 = 3.841$ at 95% confidence level, $q = 0.5$

Table 3.2 Sample size determination and distribution

No	Respondent category	Study population	Sampling rule and technique	Sample size	Data collection tool
1	Visitors	79632*	<ul style="list-style-type: none"> • KENPRO (2012). • Simple random sampling (SRS) 	413	<ul style="list-style-type: none"> • Questionnaire
2	Tour guides	1373*	<ul style="list-style-type: none"> • KENPRO (2012). • SRS 	157	<ul style="list-style-type: none"> • Questionnaire
3	Tourist vehicle	1373*	<ul style="list-style-type: none"> • KENPRO (2012). • SRS 	388	<ul style="list-style-type: none"> • Observation Checklist
4	Visitor managers	20*	<ul style="list-style-type: none"> • 30% rule • Purposive sampling 	9	<ul style="list-style-type: none"> • Interviews
		Totals		967	

Source: Researcher, 2022 KEY: figures * (estimated figures)

3.5 Instrumentation and Data Collection

The study used quantitative and qualitative data collection tools. First, they provided better data collection and analysis, complimented one another by maximising their strengths and minimising weaknesses, and cross-validated. Secondary sources were sought by analysing ex post facto data like arrival trends, visitor feedback reports, maps, and census data. Primary data was acquired utilising questionnaires, checklists, and semi-structured interview schedules. The researcher initially collected quantitative data from questionnaires (November 2020 to February 2021 and mid-June to August 2021), then qualitative data through interviews (August 2021).

3.5.1 Questionnaires

A questionnaire is a compilation of questions for collecting data from a study population sample. According to (Babbie, 2016), questionnaires rank among the most popular tools for data collection. However, their success in data collection depends on proper design and a scientific basis of preparation that leverages the advantages and reduces the disadvantages.

The research used a Likert scale and ordinal and nominal data values in the semi-structured questionnaire for data collection. Proportionate sampling and simple random sampling were done during touristic seasons for tourists and tour guides visiting MMNR. The probability sampling procedures mentioned above (Table 3.2) were used to minimise bias on the researcher's part and give equal opportunity to visitors (n=413) and tour guides (n= 157) as respondents for the questionnaires totalling n= 570. Questionnaires were distributed to the tour guides and visitors at the Sekenani main gate, Ololaimutia, Talek, Purngat, and the Keekerok airstrip entry points, with the majority returning to the former two gates, which were the main entry points. This approach was adopted as guests were given ample time to fill in their free time and return questionnaires

later than during the busy gate check-in formalities on arrival at MMNR. In this regard, the researcher sought the services of two research assistants/surveyors, one at Sekenani Gate and another at Ololaimutia Gates, which were the busiest. Data collected from visitor and tour guide questionnaires (n=570) was used to answer all four research objectives by providing quantitative and qualitative data (see Appendix I and Appendix II).

3.5.2 Interviews

The interview method of collecting data involves presenting oral-verbal stimuli and replies through oral-verbal responses (Babbie, 2016; Tonon, 2019). This tool was chosen because it was envisaged to provide an excellent opportunity to explain and probe for more information from the respondents. A semi-structured interview guide (See Appendix III) with a list of questions was used to facilitate data collection from nine (9) Key Informant Interviews (KII). This technique used the researcher's judgment in determining cases with a specific purpose in mind and that some are thought to be more appropriate than others in the target population (Babbie, 2016). Consequently, nine (9) managers involved in visitor management were purposively selected for the interviews; these were wildlife managers (2), wildlife ranger supervisors (2), tourism officers (3) and tour guide association chairpersons (2). Data collected using this tool was analysed qualitatively to validate the findings from the questionnaires.

3.5.3 Observation Checklist

The study used an observation checklist for vehicle tracking during wildlife viewing to support the questionnaire data to answer the four research objectives. The researcher only filled out the field observation checklist to ensure uniformity in data collection as a participant field observer/ wildlife viewer. The observation checklist enabled the research to document exhibited behaviour during wildlife viewings. The wildlife viewing movement patterns and favourite viewing spots. The date, location, number of visitors and vehicles in a wildlife sighting, duration at the sighting, and the general observance of MMNR visitor codes of conduct (see Appendix IV). Each tour vehicle, its occupants, and their collective behaviour were considered as one respondent for observational data collection.

3.6 Data Analysis and Data Presentation

3.6.1 Quantitative Data Analysis

Data collected from questionnaires (n=570) were used to answer objectives one, two, and three, while n=388 was for the fourth objective. The raw data collected was processed and prepared for quantitative analysis by editing, coding, and keying into SPSS version 27. Spearman correlation tests were used to establish the relationship between variables in Ho1, Ho2, Ho3, and Ho4 at a

95% confidence interval and a 5% significance level. Therefore, if the calculated correlation had a significance level lower than the given *p-value* of 0.005, the null hypothesis was rejected, and vice versa.

3.6.2 Qualitative Data Analysis

Data collected using interviews (n=9) was analysed qualitatively to validate the findings from quantitative data for the four objectives of the study. Similarly, qualitative data from the questionnaire was used to collaborate with the results from the quantitative analysis of objectives (i), (ii), (iii), and (iv) and hypotheses Ho1, Ho2, Ho3, and Ho4. The raw qualitative data were transcribed and analysed with the help of content analysis in NVivo (version 12). Content analysis is a qualitative data analysis technique focusing on the text's implicit meaning rather than its explicit content. According to Denscombe (2007), this approach is familiar in social psychology, sociology, and linguistics. It is used in a wide range of social research areas. This approach was relevant and applicable to this study because tourism is a social science involving people's attitudes and psychology, stakeholder management relates to sociology, and NI is a persuasive communication aspect of linguistics.

Verbatim quotation of interview responses was also made using the format '*Q1K118, Tourism Officer.*' Where '*Q1*' refers to the '*question number,*' '*K11'8* refers to the '*Key Informant Interview*' and his/her '*number,*' and lastly, the general role of the informant at MMNR. The research presented findings using relevant approaches. Not limited to but included tables and cross-tabulation of data, charts and verbatim quotations for qualitative data interviews.

CHAPTER 4: RESULTS AND DISCUSSION

Chapter Overview

This chapter presents the study results and discussions guided by the study objectives to answer the research questions and hypothesis testing results. These are the effects of wildlife viewers' demographic characteristics on behaviour, the impact of tour guiding delivery on wildlife viewers' behaviour, the influence of NI on the spatial wildlife viewing behaviour patterns, and NI's strong and weak points.

4.1 Results

4.1.1 Respondents' Demographics

The study was conducted at the Maasai Mara National Reserve (MMNR), one of Kenya's most visited wildlife tourism destinations. MMNR has been christened as the world's eighth wonder due to the seasonal wildebeests' migration that attracts high visitor numbers during the high season. The research adopted a descriptive survey design, and questionnaires were the primary data collection tool. Descriptive and inferential statistics were employed to present and analyse data using spearman's correlation to test the research question. In interpreting spearman's correlations, the study adopted the following ranking of correlation coefficients; 0.00–0.19 very weak correlations; 0.20–0.39 weak; 0.40–0.59 moderate; 0.60–0.79 strong; 0.80–1.0 very strong correlations as adopted from (Akoglu, 2018).

Data collection took a six (6) months Period; November (20% of the respondents), December (11.2%), January (10.4%), and February (7%) for the low tourist season, and the months of August (31.2%) and September (20.2%) For the high season (Figure 4.1 below). They constituted 51% of the respondents in the high season and 49% for the low season, giving a total sample size of $n = 570$. The respondents ($n = 570$) included 67.5% Kenyans, 18.7% non-residents, and 13.7% resident foreigners that visited MMNR. 61.9% of the respondents were males, 36.3% were females, and a further 1.8% for others (Figure 4.2). The skewed data towards the male gender was because 157 of the 570 respondents were tour driver guides who were predominantly male (Figure 4.3). Nevertheless, it was observed that '*There are slightly more males travel into Masai Mara than females*' [Q2KII5, Wildlife Warden]. Further, the visitation trends by nationality and gender were affected by covid; as an interview respondent attests, '*international visitors dropped drastically due to COVID-19, but domestic travellers increased on the flip side*' [Q1KII7, Tourism Officer].

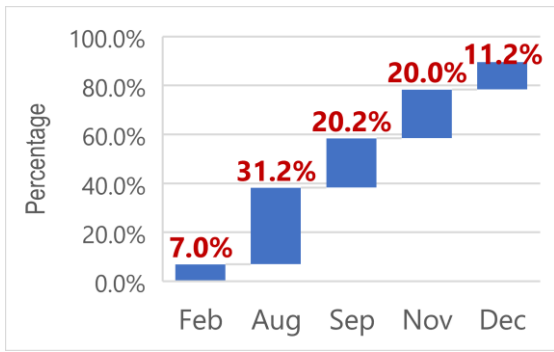


Figure 4.1: Data collection Months (n=570)

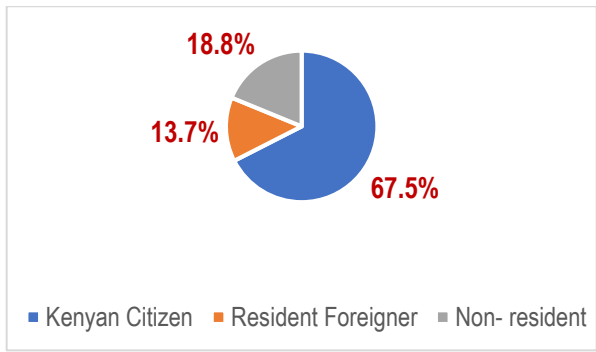


Figure 4.2: Nationality of respondents (n=570)

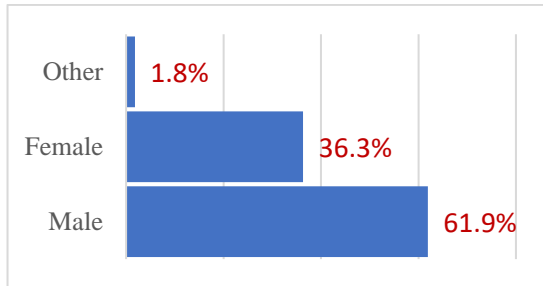


Figure 4.3: Gender of respondents (n=570)

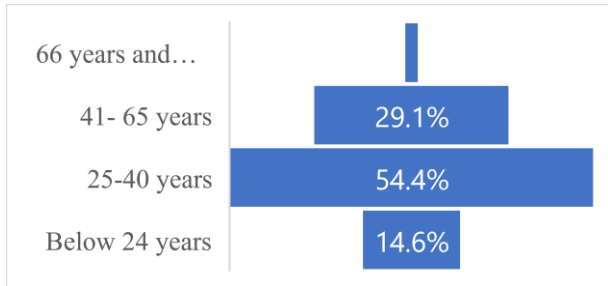


Figure 4.4: Respondents' Age structure (N=570)

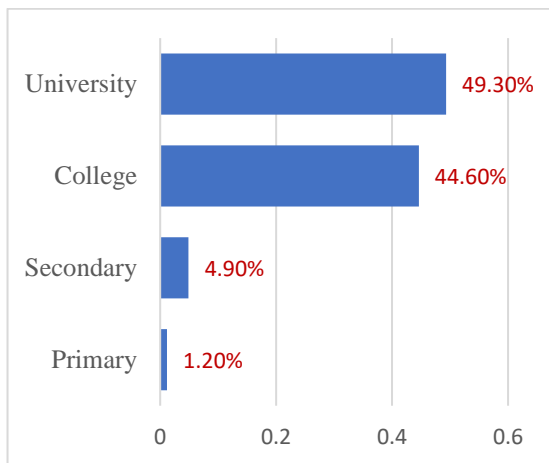


Figure 4.5: Education level (n=570)

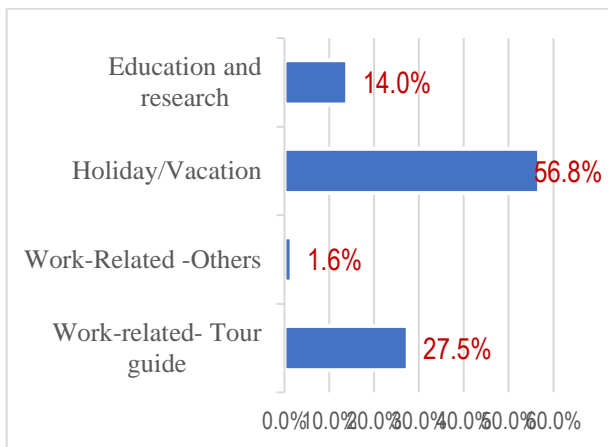


Figure 4.6: Respondents' purpose of visit (n=570)

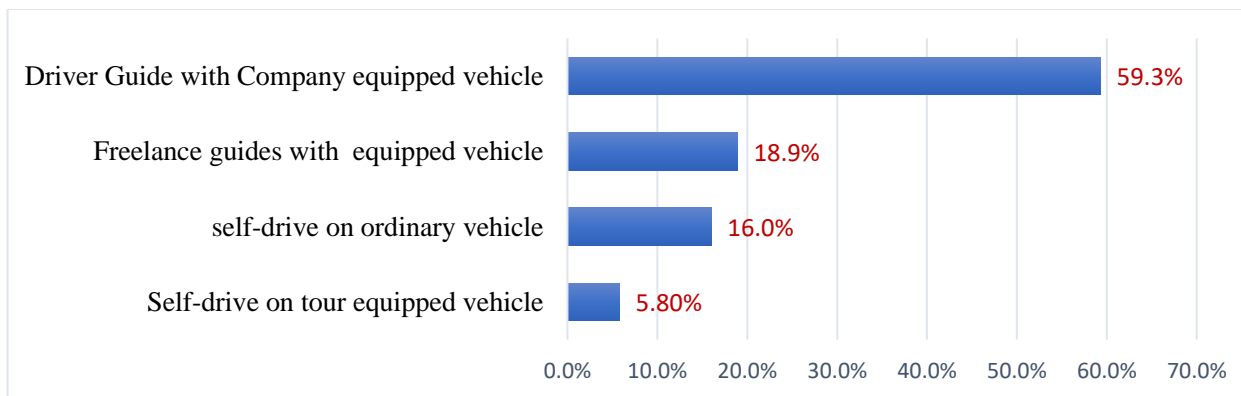


Figure 4.7: Vehicle type used by respondents (n=570)

(Research Data, 2022)

The majority of the respondents fell in the youthful category of ages 25–40 years (54.4%), followed by those aged 41–65 years (29.1%), those aged below 24 years constituted 14.6%, and lastly, senior citizens (66 years and above) with a small fraction of 1.9% as detailed in Figure 4.4 above. The demographics of the visitor age completely departed from past statistics, where senior citizens constituted a more significant percentage of travellers than the current scenario attributed to the COVID-19 scare. It was especially true for senior citizens whom COVID-19 could have constrained their vacationing despite having higher travel propensity characteristics, as supported by sentiments by some of the interviewees. *‘there was a slight change in the age demographics of visitors. The number of elderly aged 66 years and above reduced compared to the past; this could be COVID-19 scare related’* [Q3KII1, Wildlife Warden].

Contrastingly, the youthful part of the population travelled more during the COVID-19 pandemic as they might have considered themselves to have better immunity levels. On the education level of the respondents (n = 570), over 49.3% of the respondents had a university education, and 44.6% had college-level education. 4.9% and 1.2% had secondary and primary education, respectively (Figure 4.5 above). Regarding the purpose of the visit, 56.8% of the respondents were on holiday/vacation, 27.5% were tour driver guides at work, 14% were on education and research, and a small fraction (1.6%) were visiting for other work-related purposes (Figure 4.6). Indeed, vacationers and education and research visits constitute the primary travel purposes into MMNR as supported by assertions from interviewees that *‘most tourists into the Masai Mara come on holiday mainly and a small fraction visits for education and research. However, before COVID-19, a significant number of tourists used to visit under incentive travel’* [Q5KII2, Tourism Officer] and that *‘...there is not much change here. Most visitors come because of vacationing’* [Q5KII9, Chair Person Mara Tour Guides person].

The research also sought to establish the most commonly used mode of accessing MMNR. Study results revealed that company tour-equipped vehicle with a driver-guide (59.3%) was the most popular means, followed by local freelance guides with tour-equipped vehicles (18.9%), and closely followed by self-drive visitors on ordinary vehicles (16%) (Figure 4.7). Visitors on Self-drive on tour-equipped vehicles were the least used means for accessing MMNR. These results endorsed that *‘many tourists are comfortable getting services from the experts; tour company vehicles with driver guides...however that tourists on self-drive is a recent phenomenon with the tarmacking of Narok to Sekenani road’* [Q6KII8, Tour Guide Association Chair Person]. Further to, these *‘freelance local community guides with vehicles vary from one gate to another, but mainly at Sekenani, Talek, and Ololaimutia gates in that order with the vehicles used vary, but a majority of tourists come by tour company vehicles with driver guides’* [Q6KII5, Wildlife Warden]. Some

interviewees observed that ‘COVID-19 disrupted everything and that most foreign tourists used to hire tour company vehicles with drivers for travel. However, subsidized rates saw more Kenyans taking the tour vans as others opted for self-drive’ [Q6KIII, Wildlife Warden].

4.1.2 Effects of Wildlife Viewer’s Demographic Characteristics on Behaviour

4.1.2.1 Descriptive statistics

The study sought to establish the behaviour of wildlife viewers as they interacted with NI. As detailed in figure 4.8 below, study findings generally showed positive results.

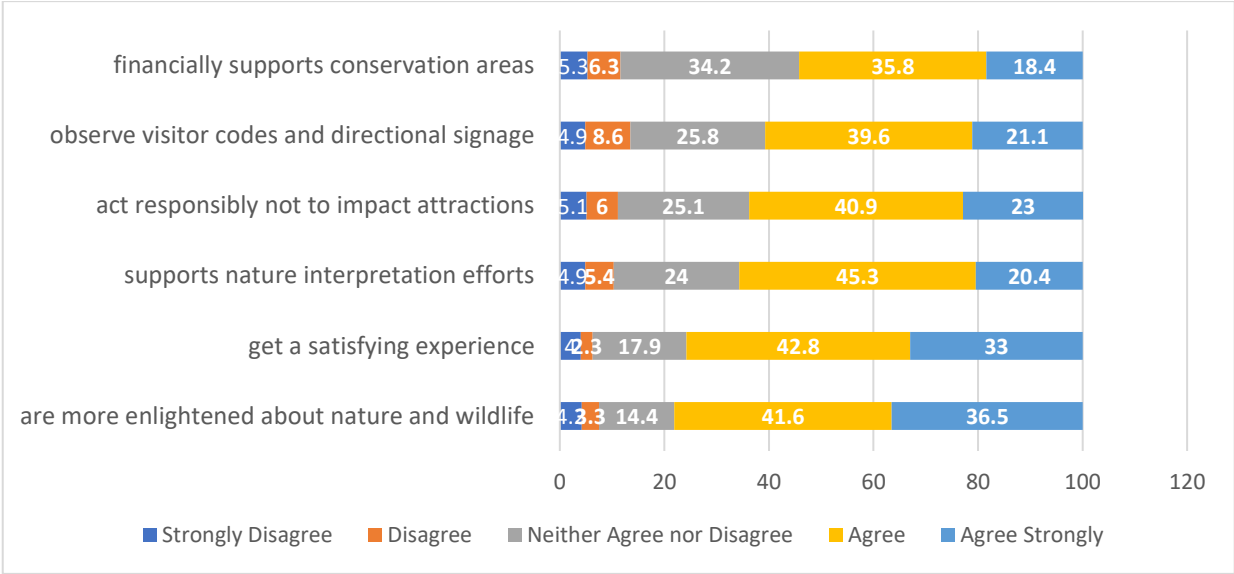


Figure 4.8: Behaviour exhibited by wildlife viewers (n=570) (Research Data, 2022).

Results indicated that NI made respondents (N=570) more enlightened about nature and wildlife was positively depicted by 77.1% of the responses (36.5% strongly agree, and 41.6% agree). Neither agree nor disagree stood at 14.4%, disagree at 3.4%, and strongly disagree at 4.2%. Ranked second was that NI enables wildlife viewers to get a satisfying experience and posted 33% of the responses as strongly agree, 42.8% agree, 17.9% as neither agree nor disagree, 2.3% disagree, and 4% strongly disagree. Findings further revealed that NI made wildlife viewers support NI efforts. 20.4% of the respondents strongly agreed, 45.3% agreed, 24% neither agreed nor disagreed, 5.4% disagreed, and 4.9% disagreed strongly, where N=570.

As a NI technique, NI was observed to make wildlife participants act responsibly, not to impact attractions. Study results were also positively skewed, with 23% of the respondents strongly agreeing, 40.9% agreeing, 25.1% neither agreeing nor disagreeing, 6% disagreeing, and 5.1% strongly disagreeing (Figure 4.8 above). Similarly, responses affirmed that NI made wildlife viewers observe visitor codes and directional signage, with 21.1% strongly agreeing, 39.6% agreeing, 25.8% neither agreeing nor disagreeing, 8.6% disagreeing, and 4.9% disagreeing

strongly. Last on this ranking was the ability of NI to make *wildlife viewers financially support conservation areas*, with responses marginally skewed to the positive (54.2%). Strongly agreed with 18.4%, agreed with 35.8%, neither agreed nor disagreed with 34.2%, disagreed with 6.3%, and disagreed strongly with 5.3%.

4.1.2.2 Correlations and hypothesis testing (demographics versus behaviour)

The study went further to establish if the demographic characteristics of the wildlife viewers affected their attitudes towards the impact of NI on behaviour regulation. A few very weak correlations were registered, as detailed in Table 4.1 below. Correlation tests were run between the behaviour attributes and month of the visit to depict the touristic season, respondents' nationality, gender, age, education level, visit purpose and vehicle type. The behaviour attribute that NI made wildlife viewers *more enlightened about nature and wildlife* yielded one very weak correlation with the *purpose of the visit* ($r_s = 0.093, p = 0.027, n = 570$), with the other demographic characteristics of the respondents not correlating.

Table 4.1: Correlations of Behaviour versus Demographics (n=570)

		Month of Visit	Nationality	Gender	Age	education level	purpose of visit	Vehicle Used
are more enlightened about nature and wildlife	r_s	-.077	-.026	-.008	-.061	-.006	.093*	.016
	p -value	.065	.532	.848	.147	.893	.027	.710
act responsibly not to impact attractions	r_s	-.058	.033	.034	-.039	-.041	.142**	-.064
	p -value	.167	.437	.420	.356	.325	.001	.128
observe visitor codes and directional signage	r_s	-.052	.015	.047	-.070	-.022	.155**	-.064
	p -value	.212	.722	.265	.095	.596	.000	.125
supports NI efforts	r_s	-.094*	.106*	.020	-.123**	-.015	.176**	-.087*
	p -value	.024	.012	.637	.003	.715	.000	.039
financially supports conservation areas	r_s	-.036	.083*	.007	-.060	-.044	.098*	-.056
	p -value	.392	.047	.873	.153	.295	.020	.180
get a satisfying experience	r_s	-.115**	.070	-.008	-.012	-.110**	.046	.012
	p -value	.006	.094	.841	.778	.009	.270	.781

KEY: r_s - Spearman's rho Correlation coefficient

**.	Correlation is significant at the 0.01 level (2-tailed).	*	Correlation is significant at the 0.05 level (2-tailed).
No correlation, Accept null hypothesis		Very weak correlation; Reject the null hypothesis	

(Research Data, 2022)

Wildlife viewers *act responsibly not to impact attractions negatively* and *observe visitor codes and directional signage* had one very weak positive correlation each with the purpose of visit yielding $r_s = 0.142, p = 0.001, n = 570$, and $r_s = 0.155, p = 0.000, n = 570$ respectively (Table 4.1 above). No correlations were registered with the other demographic characteristics of respondents.

Meaning the responses and behaviour were never affected by the month of visit, nationality, gender, age, education level, and type of vehicle used. Albeit a very weak positive correlation, the visit's purpose affected NI's ability to make wildlife viewers act responsibly and not impact attractions negatively.

NI makes *wildlife viewers support NI efforts* had several very weak negative correlations with the month of visit ($r_s = -0.155, p = 0.024, n = 570$), age ($r_s = -0.123, p = 0.003, n = 570$), and type of vehicle used ($r_s = -0.087, p = 0.039, n = 570$). On the other *hand*, nationality ($r_s = -0.106, p = 0.012, n = 570$), and purpose of the visit ($r_s = -0.176, p = 0.000, n = 570$), had a very weak positive correlation with the *wildlife viewers supporting NI efforts* (Table 4.2 below). In addition to these findings, gender and level of education did not correlate with *wildlife viewers supporting NI efforts*. These results indicated that gender and level of education did not affect *wildlife viewers' support for NI efforts*. Therefore, the null hypothesis was rejected for this attribute (Table 4.2).

Table 4.2: Objective one: Null Hypothesis testing Summary matrix

Behaviour Attribute	Month of Visit	Nationality	Gender	Age	education level	purpose of visit	Vehicle Used
Are more enlightened about wildlife	accept	accept	accept	accept	accept	reject	accept
act responsibly not to impact attractions	accept	accept	accept	accept	accept	reject	accept
observe visitor codes and directional signage	accept	accept	accept	accept	accept	reject	accept
supports NI efforts	reject	reject	accept	reject	accept	reject	reject
financially supports conservation areas	accept	reject	accept	accept	accept	reject	accept
get a satisfying experience	reject	accept	accept	accept	reject	accept	accept

(Research Data, 2022)

Wildlife viewers' attitudes to *financially support conservation areas* had two very weak positive correlations with nationality ($r_s = 0.083, p = 0.047, n = 570$), and purpose of visit ($r_s = 0.098, p = 0.020, n = 570$). These were nearly negligible, weak negative correlations that implied a direct relationship between nationality and purpose of visit and *financially supporting conservation areas*. On the contrary, the month of visit, gender, age, education level, and type of vehicle used did not correlate with *wildlife viewers who were not motivated by NI to support conservation areas financially*. Therefore, the null hypothesis was rejected for this attribute (Table 4.2 above).

NI made *wildlife viewers get a satisfying experience* also had two very weak negative correlations with the month of visit ($r_s = -0.115, p = 0.006, n = 570$) and education level ($r_s = -0.110, p = 0.009, n = 570$). These were very weak inverse correlations; as one variable increased, the other decreased. However, on the flip side, NI gave *wildlife viewers a satisfying experience that did not*

correlate with nationality, gender, age, the purpose of visit, and the type of vehicle used. Thus, the null hypothesis was rejected for these attributes (Table 4.2).

4.1.3 Effect of Tour Guiding Delivery on Wildlife Viewers' Behaviour

4.1.3.1 Descriptive statistics

The study selected dummy variables to evaluate the skills and competencies in tour guiding, herein referred to as tour guide delivery. These were, *'tour guides possess a good understanding of wildlife* and *'good tour guiding skills,' provide enlightening NI and communicate visitor codes*. Other tested attributes were *'tour guides require regular interpretational training and sensitisation'*, and *'visitor codes are communicated to tourists by tour guides'* (Figure 4.9 below).

The study used a five-point Likert scale to evaluate these dummy tour guide attributes. Study results indicated that the attribute *'tour guides had a good understanding of wildlife'* had the highest affirmative attitudes. 42.1% of the respondents strongly agreed, 36.1% agreed, 15.1% neither agreed nor agreed, 2.3% disagreed, and 4.4% strongly disagreed. These results were largely positive affirmations (78.2%) that tour guides understood wildlife well, 15.1% were ambivalent, and 6.7% had negative attitudes. Ranked second was *'tour guides had good tour guiding skills,'* which registered 73.4% positive responses (38.6% strongly agree, 34.6% agree) (Figure 4.9 below). Ambivalence stood at 18.2%, while negative responses were at 8.5% (3.9% disagree, and 4.6% strongly disagree). Third, tour guides provide enlightening NI in the ranking with 71.1% affirmative responses (30.2% strongly agree, and 40.9% agree). Neither agree nor disagree had 20.9% of the responses, disagree had 4.4%, and strongly disagree was 3.7%. *Tour guides communicate visitor codes/dos and do not* was next in ranking with other 64.6% positive responses representing 30.2% strongly agree, and 34.4% agree. Ambivalence grew to 22.5%, while disagreeing and strongly disagreeing had 6.5% responses. Lastly, *'tour guides required regular interpretational training and sensitisation'* with 58.1% (strongly agree, 24.4%, and agree 33.7%) affirmations. Neither agree nor disagree rose to 27.4%, while disagree was at 7.5% and lastly, 7% disagreed strongly (Figure 4.9).

Interviews yielded similar assertions, such as *'tour guides in MMNR were ranked highly, although they require refresher interpretational training and sensitization'* [Q8KII1, Wildlife Warden]. Other interviewees echoed that *'most tourists into the MMNR have a tour guide, whether in the tour company vehicle, or some self-drive tourists hiring local community guides at the entry points to guide them within the MMNR. tour guides play a critical role and thus require refresher training, especially freelance community guides'* [Q8KII7, Tourism Officer]. Moreover, *'generally, many tour guides appear to have good training backgrounds in NI and tourism.*

However, some require retraining, and there is a need for a refresher course' [Q8KII2, Tourism Officer].

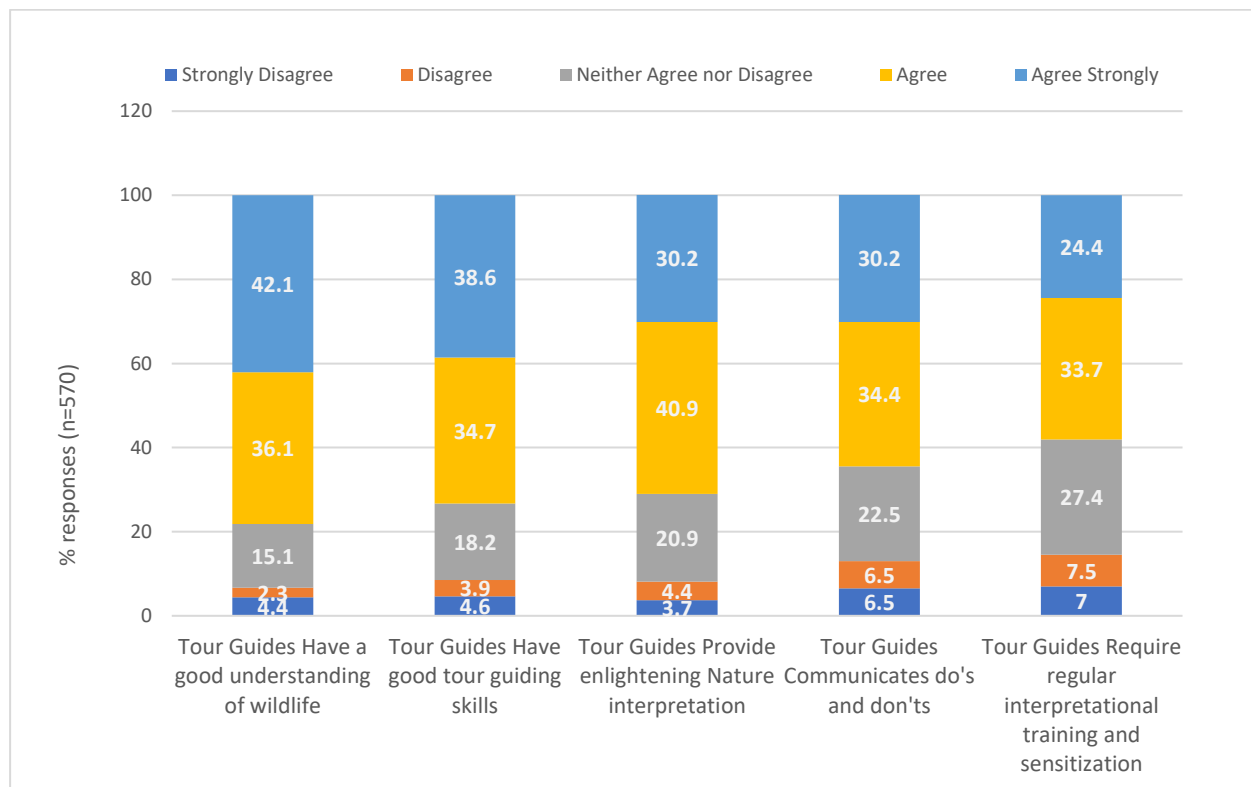


Figure 4.9: Tour Guiding Competencies (n=570) (Research Data, 2022)

The above-highlighted questionnaire and interview results notwithstanding, the researcher observed that some tour guides were either ignorant, overlooked, or were just deviant of the visitor rules and wilderness codes of conduct because there are no rangers at most sightings to enforce compliance. As wildlife viewing in the MMNR was on safari jeeps, most visitors were under tour guides' direct guidance and control. Thus, no observance of rules was attributed mainly to tour guides abrogating their roles, as shown in Figures 4.10 (a) to 4.12 (b) below.

In most cases, tour guides summoned or alerted each other to wildlife sightings of interest, migration crossings or the location of ranger patrol vehicles via VHF radios. When ranger patrol vehicles were never in sight, some tour guides deliberately ignored most of the best practices and professional conduct around wildlife sightings, especially near the big cats and migration crossings.

4.1.3.2 Correlational results and hypothesis testing

In an attempt to assess the relationships between the tour guide competencies and the behaviour exhibited by wildlife viewers and consequently test the hypothesis, spearman's correlation test was done. Study results (in Table 4.3 below) revealed that *wildlife viewers became more enlightened*

about wildlife had one very weak and five weak positive correlations at a 99% confidence interval



(a)



(b)

Figure: 4.10 (a) and (b); Overcrowding, too close to Mara river bank, sitting /standing on rooftops and noise-making at migration crossing points (Source: Mara Conservancy, 2023)



(a)



(b)

Figure 4.11 (a) and (b); Overcrowding, trailing and harassing Leopard and cub (Source: Researcher, 2022)



(a)



(b)

Figure 4.12 (a) Overcrowding at a leopard sighting, (b) Overcrowding a pride of lions and heavy truck going off main tracks (Source: Mara Conservancy, 2023)

with the tour guiding delivery attributes. *Tour guides communicated do's, and do not's* registered $r_s = 0.241, p = 0.000, n = 570$. *Tour guides had a good understanding of wildlife* yielded $r_s = 0.290, p = 0.000, n = 570$. On the other hand, *tour guides had good tour guiding skills* had $r_s = 0.260, p = 0.000, n = 570$, *tour guides provided enlightening NI* generated $r_s = 0.273, p = 0.000, n = 570$,

and lastly, *visitor codes are communicated to tourists by tour guides* $r_s = 0.338, p = 0.000, n = 570$. A very weak positive correlation was generated by *'tour guides required regular interpretation training and sensitization'* ($r_s = 0.160, p = 0.000, n = 570$).

Table 4.3: Tour guide competencies correlated with wildlife viewers' behaviour (n=570)

Behaviour Attributes		Tour Guides Communicates do's and do not's	Tour Guides Have a good understanding of wildlife	Tour Guides Have good tour guiding skills	Tour Guides Provide enlightening NI	Tour guides require regular interpretation training	Are communicated to tourists by tour guides
are more enlightened about nature and wildlife	r_s	.241**	.290**	.260**	.273**	.160**	.338**
	p -value	.000	.000	.000	.000	.000	.000
act responsibly not to impact attractions	r_s	.226**	.179**	.179**	.207**	.104*	.307**
	p -value	.000	.000	.000	.000	.013	.000
observe visitor codes and directional signage	r_s	.249**	.226**	.236**	.238**	.138**	.306**
	p -value	.000	.000	.000	.000	.001	.000
supports NI efforts	r_s	.239**	.244**	.252**	.240**	.062	.339**
	p -value	.000	.000	.000	.000	.137	.000
financially supports conservation areas	r_s	.193**	.193**	.190**	.195**	.105*	.251**
	p -value	.000	.000	.000	.000	.012	.000
get a satisfying experience	r_s	.257**	.354**	.368**	.313**	.103*	.299**
	p -value	.000	.000	.000	.000	.014	.000

KEY: r_s - Spearman's rho Correlation coefficient

** . Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

No correlation, Accept null hypothesis **Very weak correlation**; Reject null hypothesis **Weak Correlation**; Reject null hypothesis

(Research Data, 2022)

At a 99% confidence interval, *'wildlife viewers acted responsibly not to impact attractions'* had three weak positive correlations. First, with *'tour guides communicate do's and do not's'* ($r_s = 0.226, p = 0.000, n = 570$), *'tour guides provide enlightening NI, do not's'* ($r_s = 0.207, p = 0.000, n = 570$), and lastly, *'visitor codes are communicated to tourists by tour guides'* ($r_s = 0.307, p = 0.000, n = 570$) (Table 4.3 above). In addition to these weak positive correlations, *wildlife viewers acted responsibly not to impact attractions'* had three very weak positive correlations. These were *'tour guides have a good understanding of wildlife'* ($r_s = 0.179, p = 0.000, n = 570$), *'tour guides have good tour guiding skills'* ($r_s = 0.179, p = 0.000, n = 570$), and *'tour guides require regular interpretation training and sensitization'* ($r_s = 0.104, p = 0.013, n = 570$). Whereas the first two very weak positive correlations had a 1% error value, the latter had a 5% error value.

Study results further indicated that *'wildlife viewers observe visitor codes and directional signage'* had five weak positive correlations. These were with *'tour guides communicate do's and do not's'* ($r_s = 0.249, p = 0.000, n = 570$), *'tour guides have a good understanding of wildlife'* ($r_s = 0.226, p = 0.000, n = 570$) *'tour guides have good tour guiding skills'* ($r_s = 0.236, p = 0.000, n = 570$), *'tour guides provide enlightening NI'* ($r_s = 0.238, p = 0.000, n = 570$). Visitor codes *'are communicated*

to tourists by tour guides' ($r_s = 0.306, p = 0.000, n = 570$). In addition, 'tour guides require regular interpretation training and sensitization' ($r_s = 0.138, p = 0.001, n = 570$) (Table 4.3). All these correlational results were at a 99% confidence interval, indicating that the findings were reliable and verifiable.

'Wildlife viewers' support NI efforts' yielded one no correlation and five weak positive correlations at a 99% confidence interval. The weak positive correlations were yielded with 'tour guides communicated do's and do not's' ($r_s = 0.239, p = 0.000, n = 570$), 'tour guides have a good understanding of wildlife' ($r_s = 0.244, p = 0.000, n = 570$), and 'tour guides have good tour guiding skills' ($r_s = 0.252, p = 0.000, n = 570$). Others were 'tour guides provide enlightening NI' ($r_s = 0.240, p = 0.000, n = 570$), and that 'visitor codes are communicated to tourists by tour guides' ($r_s = 0.339, p = 0.000, n = 570$). It is only 'tour guides require regular interpretation training and sensitization' ($r_s = 0.062, p = 0.139, n = 570$) that did not correlate with 'wildlife viewers support NI efforts' (Table 4.3).

'Wildlife viewers financially support conservation areas' generated one weak and five very weak positive correlations. Visitor codes 'are communicated to tourists by tour guides' had an $r_s = 0.251, p = 0.000, n = 570$. This weak positive correlation implied that with an increase in the communication of visitor codes to tourists by tour guides, there was a marginal increase in the number of wildlife viewers financially supporting conservation areas. Further to these results, other attributes of tour guide delivery generated very weak positive correlations: first, 'tour guides communicate do's and do not's' ($r_s = 0.193, p = 0.000, n = 570$). Second, 'tour guides have a good understanding of wildlife' ($r_s = 0.193, p = 0.000, n = 570$). Third, 'tour guides have good tour guiding skills' ($r_s = 0.190, p = 0.000, n = 570$). Finally, 'tour guides provide enlightening NI' ($r_s = 0.195, p = 0.000, n = 570$), and 'tour guides require regular interpretation training and sensitization' ($r_s = 0.105, p = 0.012, n = 570$). The first four had very weak positive correlations at a 99% confidence interval. In comparison, 'tour guides required regular interpretation training and sensitisation' with a 95% confidence interval and a very weak positive correlation. The results indicated a very weak direct relationship with 'wildlife viewers financially supported conservation areas.'

Last but not least, wildlife viewers 'got a satisfying experience' with one very weak and five weak positive correlations. 'Tour guides require regular interpretation training and sensitization' yielded a very weak positive correlation of $r_s = 0.103, p = 0.014, n = 570$. 'Tour guides communicated do's and do not's' registered a weak positive correlation of $r_s = 0.257, p = 0.000, n = 570$. Others were 'tour guides have a good understanding of wildlife' ($r_s = 0.354, p = 0.000, n =$

570), ‘tour guides have good tour guiding skills’ ($r_s = 0.368, p = 0.000, n = 570$), ‘tour guides provide enlightening NI’ ($r_s = 0.313, p = 0.000, n = 570$), and visitor codes ‘are communicated to tourists by tour guides’ ($r_s = 0.299, p = 0.000, n = 570$) (Table 4.3 above).

4.1.3.3 Recommendations for a New Tour Guide Training Curriculum

Despite these findings, the study further sought to establish the respondents' views on whether there was a need for a new training curriculum for tour guides in MMNR, Kenya.

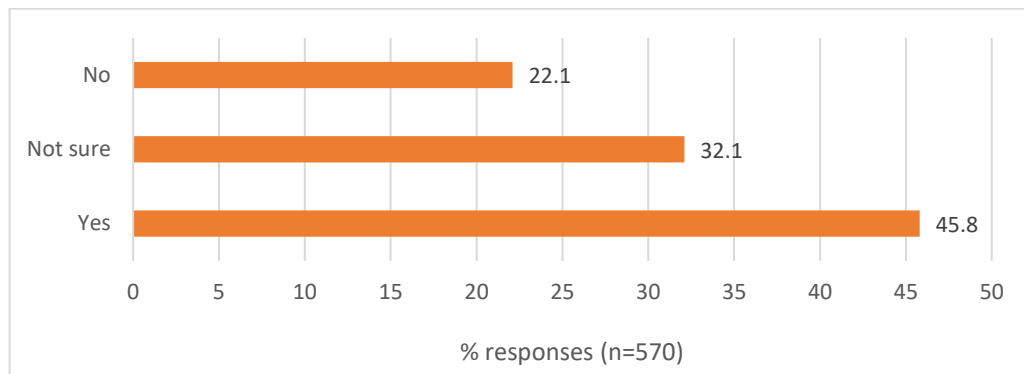


Figure 4.13: Recommends a new tour guide training program (n=570) (Research Data, 2022).

Study results indicated that about 45.8% of the respondents okayed the development of a new tour guide training curriculum in MMNR. 32.1% were unsure, and 22.1% did not support it (Figure 4.13 above). The high level of ambivalence could be because many were unsure what it entails to be a tour guide, the training background of the tour guides, or that they could not competently evaluate the tour guide delivery over a short period of interaction. The qualitative data from the open-ended questionnaire item, ‘*what topics or thematic areas should be included in a new training curriculum for tour guides at MMNR?*’ was analyzed using NVivo 12 to establish the themes and weighted word frequencies for the thematic areas. Qualitative data revealed six key thematic areas ranked per their respective weighted frequencies that should be included in the new training curriculum for tour guides, as detailed in Table 4.4 below. These were ‘professional code of conduct and laws regulating tour guiding’ (28.97%), customer care and public relations (19.24%), identification, natural history, and distribution of wildlife (18.12%), wilderness navigations, safety and survival techniques (15.51%). In addition to these, other topics were wildlife behaviour and managing wildlife encounters (9.65%), conservation, and protected area management (7.95%). The study yielded a unanimous endorsement of a new tour guide training curriculum from the key respondents interviewed at MMNR (Table 4.4).

Table: 4.4: Weighted Word Frequencies of Emerging Thematic Areas.

Item No.	Theme/ topic	<i>contextually related words</i>	Frequency	Weighted percentage
1	Professional Code of conduct and laws regulating tour guiding	Academic, access, adherence, appearance, area, available, aware, basic, behaviour, call, care, check, classification, codes, communications, compass, conduct, conservation, conversant, correction, course, courtesy, culture, current, cut, delivery, devices, directions, discipline, dos, educate, education, emphasis, enlightening, essence, ethics, etiquette, experience, follow, friendly, good, guide, guided, guides, guiding, handle, handling, help, history, information, informed, institution, interpretation, interpretational, knowledge, language, languages, learn, learning, level, local, management, managing, measures, new, norm, number, observation, opinion, order, park, performance, plant, principles, process, professionalism, psychology, read, refresher, region, regulations, relate, reserve, respect, rules, saw, service, shape, skilled, skills, studies, taking, taught, taxonomy, teach, techniques, technology, ticket, time, topics, tour, tracking, trails, train, trained, training, tree, trip, understand, understanding, viewing, way, wilderness, work.	731	28.97
2	Customer care and public relations	Available, call, care, change, check, client, clients, conduct, conducts, conversant, course, courses, cultural, culture, customers, cut, directions, discipline, drive, effectively, effects, enlightening, essence, film, follow, general, get, guide, guided, guides, guiding, handle, handling, help, histories, histories, information, institution, involvement, issues, issues, keep, knowledge, land, language, languages, learn, learning, level, maintain, national, nature, observe, opinion, order, plant, process, read, regular, regulations, relate, relations, respect, security, service, shape, skilled, skills, stop, studies, taking, teaching, time, tracking, train, trained, training, understand, understanding, viewing, visits, way, well, work.	512	19.24
3	Natural history, identification, and distribution of wildlife	amphibians, animals, bird, birding, birds, botany, butterflies, classification, community, course, courses, culture, designated, ecosystem, fauna, flora, game, grass, group, identification, identifications, information, insect, insects, institution, kingdom, land, mammals, Mara, market, natural, nature, number, order, ornithology, plant, planting, plants, public, reptiles, species, taxonomy, tree, trees, wildlife, work	271	18.12
4	wilderness navigations, safety, and survival techniques.	Access, addition, better, bronze, call, vehicles, change, changes, changing, check, client, close, code, come, compass, computer, conservation, correction, course, culture, cut, delivery, designated, devices, directions, discipline, discoveries, drive, driving, educate, emphasis, encounter, etiquette, experience, following, get, help, guest, guide, handling, identification, identifying, implement, institution, land, level, local, locally, location, locations, management, managing, market, navigation, number, obstruction, order, park, people, preservation,	551	15.51

		process, process, protect, read, reduce, route, safely, satisfaction, saw, security, service, shape, soil, speed, speeding, stop, taking, teach, technology, time, topics, tracking, train, trip, updating, way, work.		
5	Wildlife behaviour and Managing wildlife encounters	approach, aspects, avoiding, aware, awareness, behaving, behaviour, call, check, close, come, conduct, creating, cut, disappointed, drive, film, filming, follow, following, good, group, handle, harass, harassment, interactions, interfere, keep, learn, learning, level, limits, many, market, number, observation, observing, obstruction, opinion, order, overcrowding, photography, plant, proper, radio, reduce, regular, respect, respecting, restricted, restricted, result, sat, shape, shooting, sighting, sightings, staying, stop, surround, time, tracking, tree, trip, viewing, watching, work	326	9.65
6	Conservation and protected area management	access, adaptation, area, awareness, change, classification, climate, conservation, conserving, culture, diseases, ecology, ecosystem, ecosystems, education, environment, environmental, ethics, habitat, habitation, identification, involvement, keep, kingdom, land, language, learning, maintaining, mapping, need, observation, performance, photography, preservation, process, processes, provision, result, sensitisation, surround, sustainability, taking, ticket, train, understanding, use, work,	223	7.95
		Total	2614	99.4

(Research Data, 2022)

4.1.4 Effect of Non-Personal NI on Behaviour Exhibited

4.1.4.1 Descriptive statistics

The study sought to establish how non-personal forms of NI affect the behaviour exhibited by wildlife viewers at MMNR. The study first sought to establish the interpretative services encountered in this regard (Figure 4.14 Below). Findings indicate that display boards and orientation signage were encountered by 43.3% of the respondents, followed by visitor codes (do's and do not's) with 36.8%, and lastly, visitor information centres by 13.2% of the respondents (Figure 4.14 below). The display boards were more noticeable than the visitor codes or the visitor information centres. It was also evident that visitor information points or centres were very few.

Interview responses made similar observations that there is a *'need for more non-personal forms of giving information instead of over-relying on tour guiding'* [Q7KII6, Senior Tourism Officer].

'There are no visitor information centres; more are needed and possibly manned by the tourism officers at all the entry points' [Q7KII5, Wildlife Warden].

'...signages and display boards are few, and more should be erected at wildlife crossing areas, and the Lookout' [Q7KII7, Tourism Officer].

‘The best practices in the Mara Triangle of MMNR should be replicated in the Greater Mara as the standard practice in visitor management. Visitors with diverse and quality information act responsibly and rove around the reserve easily’ [Q7KII1, Wildlife Warden].

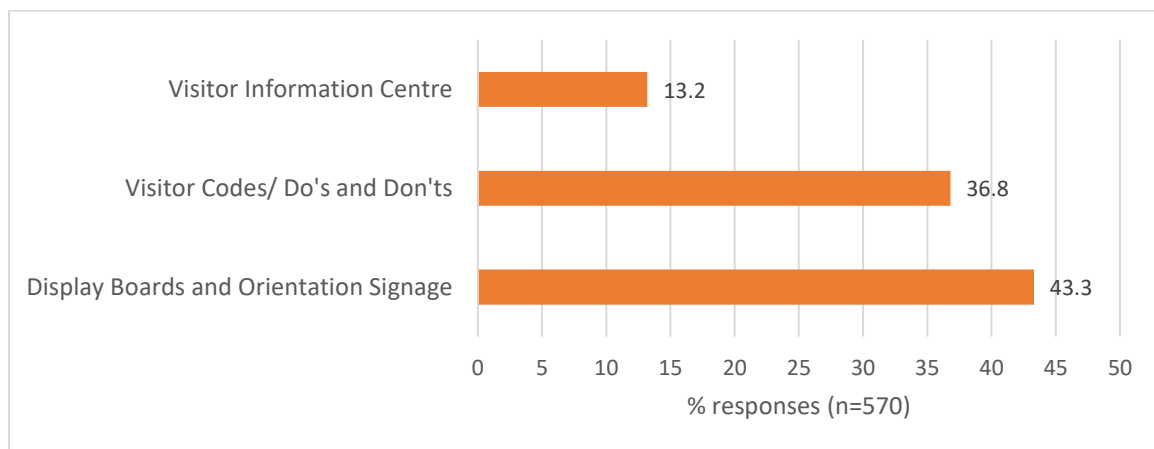


Figure 4.14: Tour Guiding versus Non-Personal NI (N=570) (Research Data, 2022)

The study further established the attitudes towards selected attributes of the existing visitor codes, display boards, and directional signage in MMNR, as detailed in figure 4.15 below. Study findings revealed that existing visitor codes, display boards, and directional signage *‘are easy to read and understand’* had the highest positive attitudes **61.1%**, strongly agree (16.5%), and agree (44.6%). Neither agree nor disagree had 22.1%, disagree was 8.1% and strongly agree with 8.8%. Second in the ranking was visitor codes, display boards, and directional signage *‘are communicated to tourists by tour guides’* had **55.8%** affirmations represented by 17.9% strongly agree, and 37.9% agree. Ambivalence stood at 29.1%, while disagreed had 7.9% and strongly disagreed at 7.2%.

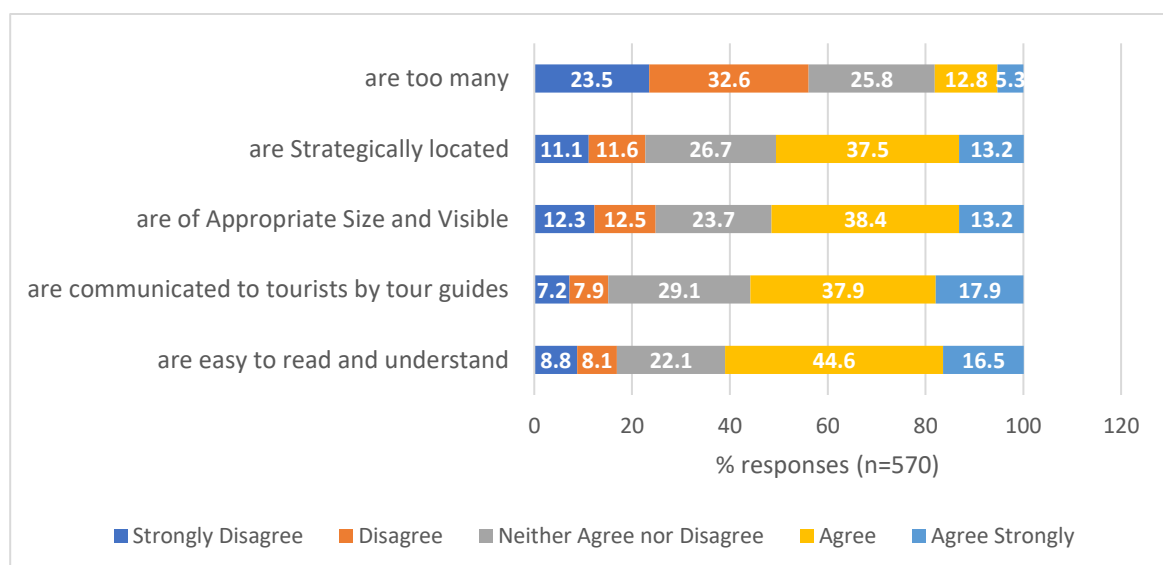


Figure 4.15: Attitudes toward Non-Personal NI (N=570) (Research Data, 2022)

Visitor codes, display boards, and directional signage *‘are appropriate in size, and visible’* had a simple majority in affirmations (**51.6%**) represented by 13.2% strongly agree, and 38.4% agree.

Neither agree nor disagree 23.7% disagree, 12.5%, and strongly disagree 12.3%. Visitor codes, display boards, and directional signage '*are strategically located*' also had marginal positive results (**50.7%**), represented by 13.2% strongly agree, and 37.5% agree. Neither agree nor disagree had 26.7%, disagreed with 11.6% and strongly disagreed with 11.1%. Visitor codes, display boards, and directional signage '*are too many*' had more dissenting views (**56.1%**), represented by 23.5% strongly disagree, and 32.6% disagree. Neither agree nor disagree had 25.8% of the responses, agree had 12.8%, while strongly agree had a paltry 5.3% (Figure 4.15 below).

From the interview responses, it was a unanimous observation that '*Indeed, visitor codes and signage are inadequate, and there is a need for a big screen or billboard of rules and regulations at all gates*' [Q11KII4, Wildlife Warden]. '*Some signage requires repairs, while other areas require more new signage*' (Example).. '*around the 'Maji ya Fisi', the Lookout and migration crossing areas*' [Q11KII5, Wildlife Warden].

'... *there has been shelving of elaborate plans to improve the signage over the last decade from 2000*'. Currently, the '*Kilometre Saba*' junction is a bit disorderly and crowded with diverse signages from individual companies in several colours, designs, and differing materials, which is not appealing... '*Reserve management should erect signages with uniform standards and order in a cost-effective manner*' ... '*It is feasible with goodwill from the reserve management*' [Q11KII1, Wildlife Warden]. Indeed, the researcher noted this inadequacy in directional signage at where existing it was haphazardly done.

On the contrary, a unique observation was made by some interviewees that...' *some tourists and driver-guide feign ignorance because, at issuance of entry tickets, a copy of the reserve rules are given. Otherwise, the flip side of an entry ticket should have a summary of the rules and regulations printed in addition to a visitor information centre at all gates and more signage within the reserve*' [Q11KII8, Tour Guide Association Chair Person].

The study further established '*why most wildlife viewers do not follow visitor codes, display boards, and directional signage in MMNR*' (Table 4.5 below). Through multiple responses questions, study results indicated that over 77.2% of the respondents opined that '*tourist pressure for better view and photography*' was the main reason for wildlife viewers to ignore reserve rules or directional signage. '*Desire to get tourists a memorable experience*' had 71.8% responses and ranked second. 46.5% of the respondents opined that some wildlife viewers were '*ignorant of the consequences of disregarding the visitor codes*' or the impact of their behaviour (Table 4.5 Below).

Table 4.5: why wildlife viewers do not observe non-personal forms of NI (N=570)

		Frequency	Per cent
1	Pressure from tourists for better views and photography	440	77.2
2	Desire to get tourists a memorable experience	409	71.8
3	Ignorance of the consequences of disregarding visitor codes	265	46.5
4	To get value for the entry fee paid	194	34.0
5	Tipping and other inducements from tourists	193	33.9
6	There is no strict enforcement of wildlife viewing codes	192	33.7

(Research Data, 2022)

Another 34% thought that some wildlife viewers did not observe visitor codes, display boards, and directional signage because they wanted *‘to get value for the entry fee paid.’* *‘Tipping and other inducements from tourists’* were also observed as another reason wildlife viewers do not observe Visitor codes, display boards, and directional signage by 33.9% of the respondents. Last but not least was the observation by 33.7%) of the respondents that *‘there is no strict enforcement of wildlife viewing codes’* (Table 4.5 above).

Indeed, interview responses were in line with these results. Some interviewees opined that *‘most of the time, driver guides are under pressure to please their tourists by driving off the road, to be closer to wildlife and be able to get a better picture; they tend to break reserve rules in that regard.’* [Q12KII2, Tourism Officer]. *‘Photography and excitement around wildlife sightings, especially the big cats and the black rhinos, make visitors forget the wildlife code of conduct’...* *‘tour guides are under pressure to please tourists .. and maybe the anticipated tipping from tourists’* [Q12KII8, Tour Guide Association Chair person].

‘There is pressure from tourists to drive off the road to view wildlife in hidden areas... We have limited vehicles that often break down, hindering enforcement patrols. ...The off-roading challenge’ ...can be managed by... ‘providing off-road driving permits restricted to research vehicles only and not commercial filming [Q12KII4, Wildlife Warden]. The study established that *... ‘enforcement is there; however, it might not be adequate. We do not have enough personnel, vehicles, or equipment to cover the Greater Mara at any given time. The Greater Mara is too big, and we do not have adequate staff and vehicles to cover all the areas, Relative to the Mara Triangle, which is very small’* [Q12KII2, Tourism Officer].

On further scrutiny of these sentiments, it was established that *‘before the 2010 constitution, the Mara Triangle was under the County Council of Transmara, while the Greater Mara was under the County Council of Narok. The management was different despite the two areas constituting*

MMNR. After the 2010 constitution, Transmara and Narok county councils were merged to make the County government of Narok. However, the management of the two areas retained their differing management structures, with the Mara Triangle continued being managed by The Mara Conservancy. There are glaring differences, with the Greater Mara being under-equipped, under-resourced, and poorly managed but overly utilized compared to the Mara Triangle. Attempts to have the whole MMNR under one management structure for uniformity and effectiveness were met with much resistance from the local community and local politics' [Q12KII1, Wildlife Warden].

'Yes, pressure from tourists and desire to give tourists a memorable experience or tips might be key motivators; however, there is a big contrast in the application and enforcement of visitor codes in The Greater Mara compared to the Mara Triangle. The Mara Triangle visitor codes and regulations are strictly enforced, and awareness creation by distributing reserve rules alongside the entry tickets at the gates. In this regard, 'the laissez-faire approach in the Greater Mara provides a weak link for flouting visitor codes' [Q12KII7, Tourism Officer].

4.1.4.2 Objective Three Correlations and Hypothesis Testing

Correlations results were majorly weak and positive, with a few moderate and very weak (Table 4.6 below).

Table 4.6: Correlations between non-personal NI techniques versus behaviour exhibited (n=570)

Behaviour attributes		are too many	are strategically located	are of appropriate size and visible	are easy to read and understand	are communicated to tourists by tour
are observed by tour guides and tourists	r_s	.269**	.536**	.544**	.588**	.565**
	p -value	.000	.000	.000	.000	.000
are more enlightened about nature and wildlife	r_s	.036	.204**	.228**	.294**	.338**
	p -value	.385	.000	.000	.000	.000
act responsibly not to impact attractions	r_s	.047	.178**	.238**	.241**	.307**
	p -value	.263	.000	.000	.000	.000
supports NI efforts	r_s	.039	.220**	.248**	.282**	.339**
	p -value	.358	.000	.000	.000	.000
financially supports conservation areas	r_s	.104*	.218**	.201**	.279**	.251**
	p -value	.013	.000	.000	.000	.000
get a satisfying experience	r_s	-.035	.186**	.251**	.286**	.299**
	p -value	.402	.000	.000	.000	.000

KEY: r_s - Spearman's rho Correlation coefficient

** . Correlation is significant at 0.01 level (2-tailed).

*. Correlation is significant at 0.05 level (2-tailed).

No correlation, Accept null hypothesis

Very weak correlation; Reject null hypothesis

Weak Correlation; Reject null hypothesis

Moderate Correlation; Reject null hypothesis

(Research Data, 2022)

Wildlife viewers' behaviour attribute 'tour guides observe visitor codes, display boards, and directional signage' collectively referred to as non-personal forms of NI, had four weak correlations. These were with '*are strategically located*' ($r_s = 0.536$, $p = 0.000$, $n = 570$), '*are of appropriate size and visible*' ($r_s = 0.544$, $p = 0.000$, $n = 570$), '*are easy to read and understand*' ($r_s = 0.588$, $p = 0.000$, $n = 570$), and '*are communicated to tourists by tour guides*' ($r_s = 0.565$, $p = 0.000$, $n = 570$). On the other hand, visitor codes, display boards, and directional signage '*are too many*' had a weak correlation ($r_s = 0.269$, $p = 0.000$, $n = 570$).

The behaviour attribute NI '*enlightened wildlife viewers more about wildlife*' did not correlate with the questionnaire item non-personal forms of NI '*are too many*' ($r_s = 0.036$, $p = 0.385$, $n = 570$). On the other hand, the behaviour attribute NI '*enlightened wildlife viewers more about wildlife*' had weak positive correlations with the other four variables representing non-personal forms of NI. First, they '*are strategically located*' ($r_s = 0.204$, $p = 0.000$, $n = 570$) and '*are of appropriate size and visible*' ($r_s = 0.228$, $p = 0.000$, $n = 570$). Third, they '*are easy to read and understand*' ($r_s = 0.294$, $p = 0.000$, $n = 570$), and lastly, they '*are communicated to tourists by tour guides*' ($r_s = 0.338$, $p = 0.000$, $n = 570$) (Table 4.6 above).

The behaviour attribute that NI '*made wildlife viewers act responsibly not to impact attractions*' also did not correlate with the questionnaire item non-personal forms of NI '*are too many*' ($r_s = 0.047$, $p = 0.263$, $n = 570$). The other four variables of non-personal forms of NI had one very weak and three weak positive correlations with the behaviour attribute that NI '*made wildlife viewers act responsibly not to impact attractions*'. That is, they '*are strategically located*' ($r_s = 0.178$, $p = 0.000$, $n = 570$), they '*are of appropriate size and visible*' ($r_s = 0.238$, $p = 0.000$, $n = 570$), '*are easy to read and understand*' ($r_s = 0.241$, $p = 0.000$, $n = 570$), and that they '*are communicated to tourists by tour guides*' ($r_s = 0.307$, $p = 0.000$, $n = 570$).

Wildlife viewers '*support NI efforts*' also did not correlate with visitor codes, display boards, and directional signage (non-personal forms of NI) '*are too many*' ($r_s = 0.039$, $p = 0.358$, $n = 570$). Contrary to these, the other four attributes of non-personal forms of NI had weak positive correlations. First, they '*are strategically located*' ($r_s = 0.220$, $p = 0.000$, $n = 570$). Second, they '*are of appropriate size and visible*' ($r_s = 0.248$, $p = 0.000$, $n = 570$). Third, they '*are easy to read and understand*' ($r_s = 0.282$, $p = 0.000$, $n = 570$), and that they '*are communicated to tourists by tour guides*' ($r_s = 0.339$, $p = 0.000$, $n = 570$) (Table 4.6 above). The weak positive correlations were at a 99% confidence interval meaning the results had a low margin of error pegged at less than 1%.

Further to these results, the behaviour attribute that NI *'makes wildlife viewers financially support conservation areas'* had a very weak positive correlation with non-personal forms of NI *'are too many'* ($r_s = 0.104, p = 0.013, n = 570$). This very weak correlation was at an error value of 5%, the only highest of all the correlations. However, the other four attributes of non-personal forms of NI had weak positive correlations. They *'are strategically located'* ($r_s = 0.218, p = 0.000, n = 570$), they *'are of appropriate size and visible'* ($r_s = 0.201, p = 0.000, n = 570$), *'are easy to read and understand'* ($r_s = 0.279, p = 0.000, n = 570$), and that they *'are communicated to tourists by tour guides'* ($r_s = 0.251, p = 0.000, n = 570$). The weak positive correlations were at a 99% confidence interval meaning the results had a low margin of error pegged at less than 1%.

Last but not least, the behaviour attribute that NI made wildlife viewers *'get a satisfying experience'* did not correlate with the questionnaire item non-personal forms of NI *'are too many'* ($r_s = -0.035, p = 0.402, n = 570$) (Table 4.6 above). However, the other four non-personal NI attributes had one very weak and three weak positive correlations. They *'are strategically located'* ($r_s = 0.186, p = 0.000, n = 570$), they *'are of appropriate size and visible'* ($r_s = 0.251, p = 0.000, n = 570$), *'are easy to read and understand'* ($r_s = 0.286, p = 0.000, n = 570$), and they *'are communicated to tourists by tour guides'* ($r_s = 0.299, p = 0.000, n = 570$). The weak positive correlations were at a 99% confidence interval meaning the results had a low margin of error pegged at less than 1%.

4.1.5 NI Impact on Wildlife Viewers' Spatial Behaviour Patterns

4.1.5.1 Descriptive statistics

Study results revealed that the Greater Mara was generally the most visited, as depicted in Table 5:13 below. Keekerok Airstrip -Mara Hippo -Sarova Region had the highest visitation at 83% of the visitors into MMNR, where $n=570$ (Figure 4.16). It was followed by the Mara Bridge and Tanzania Border Viewpoint area with 70%, The Meta plains Region at 66%, Keekerok lodge to Sand River area at 51%, and Mara Simba to Talek received about 50% of the visitors into MMNR. Important to note that Mara Bridge and Tanzania Border Viewpoint area was an intermediate point between the Greater Mara and the Mara Triangle and was characterised by many designated areas for alighting from vehicles, picnicking and migration crowing points. From the study results, the Mara Triangle was visited by fewer wildlife viewers compared to the Greater Mara. By visitation ranking, these areas are the Lower Mara Triangle and Tanzania Border (49%), Central Mara Triangle -Serena Area (47%), Mara Intrepid Explorer Rekero (35%) and the Upper Mara Triangle Governors Camp area (25%).

The research carried out a participant observation exercise to establish wildlife viewers' behaviour

patterns by trailing them and their vehicles. The vehicle monitoring was carried out over six months. Three hundred eighty-eight (n=388) different tour vehicle observations were made in November and December 2020, January, February, August, September, and October 2021 (as detailed in Table 4.7 below). Study results indicated that most of the observations were made in the high season month of August 2021 (31.4%), followed by the shoulder season months of December (22.9%) and November (20.6%). On the other hand, February 2021 had 11.9%, January 2021 had 10.8%, and September 2021 had 2.3% of the total observations (n=388).

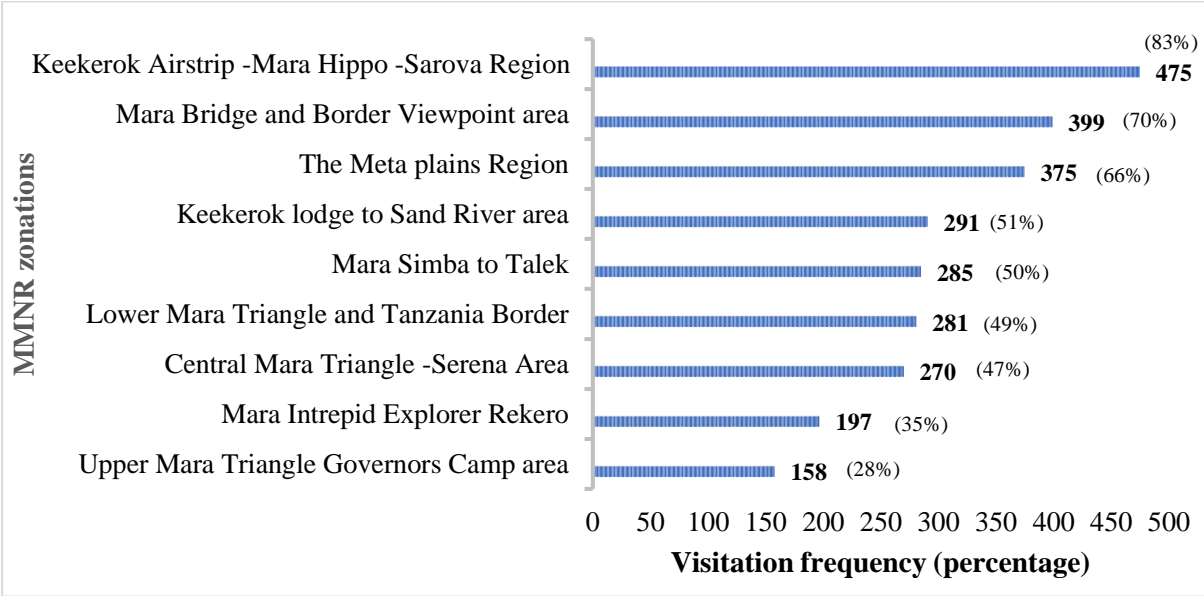


Figure 4:16 Visitor dispersion by region at MMNR (n=570) (Research data, 2022)

The study further delved into establishing the behaviour patterns around wildlife sightings. In this research, a wildlife sighting is a situation where wildlife viewing vehicles stop briefly for occupants to better view the wildlife attraction of their interest; a vehicle stoppage that could last for a few minutes or more, providing an opportunity for behaviour observation. Results revealed that big cats, lions, leopards, cheetahs, and hyenas, had the highest percentage (67.8%) of the tour vehicles spotted at such sightings locations. Large herbivores like elephants, buffaloes, giraffes, rhinos, zebras, elands, gnus, hippos, and others were a distant second, with about 27.8% of the sightings. Small wildlife or game; species such as Thomson's and grants gazelles, topi jackals, birds, and impala, to mention a few, had a mere 4.4% (Table 4.7).

Further observations indicated that about 181 game-viewing vehicles (46.7%) drove closer to wildlife at an estimated distance of 25 metres or less. Another 33.5% went to a distance between 26 to 50 metres, while 19.8% could stop their tour vehicles at 51 metres or more. The research further established the length taken by wildlife viewers and their vehicles at a sighting. Study results revealed that 29.9% of the wildlife viewing vehicles stopped for five minutes and less at a sighting, with a majority (45.4%) spending 6 - 15 minutes. 14.2% spent 16 to 25 minutes, with

another 10.6% spent more than 26 minutes. Further observations on the behaviour of wildlife viewers regarding MMNR rules and regulations indicate that harassing wild animals was the biggest challenge, with 47.7% of observed vehicles being culprits (Table 4.7). Overcrowding (45.9%) was second, followed by off-road driving in restricted areas (35.3%).

Table 4.7: Tracking Observation Data for Wildlife Viewers and their Vehicles (N=388)

Item No.	Observation attribute	SPSS coding	Attribute details	Frequency (n=388)	Percent (%) (n=388)
1	Observations Month	1	Jan 2021	42	10.8
		2	Feb 2021	46	11.9
		8	Aug 2021	122	31.4
		9	Sep 2021	9	2.3
		11	Nov 2020	80	20.6
		12	Dec 2020	89	22.9
2	Wildlife category	1	Big Cats (lions, hyenas leopards, cheetahs.)	263	67.8
		2	Large Herbivores (Rhino Zebra, elephant, buffalo, Gnu, giraffes, Eland, Hippos)	108	27.8
		3	Small wildlife (gazelles, jackals, birds, impala.)	17	4.4
3	Estimated distance from the game	1	25 metres and less	181	46.7
		2	26 - 50 metres	130	33.5
		3	51 metres or more	77	19.8
4	Duration at a Sighting	1	5 minutes or less	116	29.9
		2	6 - 15 minutes	176	45.4
		3	16 - 25 minutes	55	14.2
		4	26 minutes or more	41	10.6
5	Harass Wild Animals	1	Yes	185	47.7
6	Overcrowding	1	Yes	178	45.9
7	Off-Road driving in Restricted Areas	1	Yes	137	35.3
8	Hooting/ Making Noise	1	Yes	95	24.5
9	Driver does not Respect other Reserve Users	1	Yes	78	20.1
10	Exceeds the Speed Limit (50kph)	1	Yes	16	4.1
11	Wildlife viewers Litters	1	Yes	3	0.8

(Research Data, 2022)

Hooting and/ or making noise (24.5%) came in fourth, followed by tour drivers not respecting other reserve users (20.1%). Of little significance were tour vehicles exceeding the speed limit of 50 Kilometres per hour (kph) (4.1%) and that wildlife viewers litter (0.8%).

Responses from interviews revealed various findings. For instance, a wildlife warden observed that *‘indeed, there are cases of over-crowding at wildlife sightings, and there is a need to mainstream technologies for tracking and monitoring tourist vehicles and enforcement operations. Strict enforcement is needed to regulate negative visitor behaviour’* [Q16KII1, Wildlife Warden]. *‘The Greater Mara has a severe overcrowding problem, with six and more vehicles coming together at sightings, and the situation worsened in the high season, especially with the big cats. (however) this scenario was never experienced at the Mara Triangle’* [Q16KII6, Tourism Officer]. In addition, *‘overcrowding is common, but the 5 to 10 minutes limits are enforced at a sighting during patrols. Tourists and driver-guides easily get excited at wildebeest crossing points along the Mara river, big cats, and rhino sightings. Some tour vehicles even follow big cats when hunting in the open plains leading to off-road driving and animal harassment’* [Q16KII5, Wildlife Warden].

‘Although the rules and regulations do not allow more than five (5) vehicles at a sighting, during the wildebeest migration and crossing points at the Mara River, it is difficult to control. Some tourists asserted that they had visited several times without witnessing an actual migration crossing the mara river, and as such, rules and regulations are often ignored. In addition, popular wildlife like the five cheetahs christened- the best five or ‘tano bora,’ and lions like the marsh pride, Ashnil pride, Sarova pride, ‘Maridadi’ easily lead to disregarding of rules’ [Q16KII9, Chair Person Mara Tour Guides].

4.1.5.2 Correlation Analysis of Observed Behaviour Patterns

The ‘*month of observation*’ in this regard equated with the touristic season did not have any correlation with ‘*driver respects other reserve users*’ ($r_s = -0.047, p = 0.353, n = 388$), ‘*wildlife viewers litters*’ ($r_s = -0.098, p = 0.053, n = 388$), and ‘*drivers observe the speed limit of 50kph*’ ($r_s = -0.071, p = 0.162, n = 388$) (Table 4.8 below). These variables yielded p-values larger than the acceptable error margin of 0.05. On the other hand, the ‘*touristic season*’ had a very weak negative correlation with the ‘*number of tourists in the group*’ ($r_s = -0.173, p = 0.001, n = 388$). The same was with ‘*duration at a sighting*’ ($r_s = -0.139, p = 0.006, n = 388$), ‘*off-road driving in restricted areas*’ ($r_s = -0.179, p = 0.000, n = 388$), and lastly ‘*harass wild animals*’ ($r_s = -0.191, p = 0.000, n = 388$). Only ‘*hooting/ making noise*’ ($r_s = 0.106, p = 0.037, n = 388$) had a very weak positive correlation with the ‘*month of observation*’ (Table 4.8). Further to these findings, the ‘*observation*

month’ had a weak correlation with ‘*observation time*’ ($r_s = 0.200, p = 0.000, n = 388$), ‘*wildlife category*’ ($r_s = 0.260, p = 0.000, n = 388$), and ‘*estimated distance from wildlife*’ ($r_s = 0.320, p = 0.000, n = 388$). Two other variables had weak negative correlations with the ‘*month of visitation*’. These were ‘*number of vehicles at a sighting*’ ($r_s = -0.246, p = 0.000, n = 388$) and ‘*overcrowding at a sighting*’ ($r_s = -0.228, p = 0.000, n = 388$) (Table 4.8 below). This result indicated an inverse correlation between the ‘*month of visit,*’ the ‘*number of vehicles,*’ and ‘*overcrowding at a wildlife sighting.*’

The research also determined how the time wildlife viewers set out for wildlife drives correlated with other observable attributes. Study results revealed that ‘*observation time*’ did not correlate with three variables, that is ‘*driver respects other reserve users*’ ($r_s = -0.225, p = 0.620, n = 388$), ‘*wildlife viewers litters*’ ($r_s = 0.058, p = 0.251, n = 388$). Similarly, with ‘*hooting/ making noise*’ ($r_s = 0.004, p = 0.934, n = 388$). On the other hand, ‘*observation time*’ had very weak negative correlations with ‘*the number of tourists in the group*’ ($r_s = -0.168, p = 0.001, n = 388$), ‘*overcrowding at a sighting*’ ($r_s = -0.182, p = 0.000, n = 388$), and ‘*harass wild animals*’ ($r_s = -0.145, p = 0.004, n = 388$) all at a 99% confidence interval. There was one very weak correlation between ‘*observation time*’ and the ‘*category of wildlife*’ ($r_s = 0.181, p = 0.000, n = 388$) (Table 4.8 below).

Further to these results, there were also weak negative correlations between ‘*observation time*’ and ‘*number of vehicles at a sighting*’ ($r_s = -0.210, p = 0.000, n = 388$), ‘*off-road driving in restricted areas*’ ($r_s = -0.215, p = 0.000, n = 388$), and ‘*duration at a sighting*’ ($r_s = -0.280, p = 0.000, n = 388$), all at a 1% error margin. Last but not least, ‘*observation time*’ had a weak positive correlation with ‘*estimated distance from wildlife*’ ($r_s = 0.225, p = 0.000, n = 388$) at a 99% confidence interval. Study findings on how the ‘*number of tourists at a sighting*’ correlated with other observable behaviour attributes revealed one very strong and another strong positive correlation with ‘*the number of vehicles at the sighting*’ ($r_s = 0.900, p = 0.000, n = 388$), and ‘*overcrowding at a sighting*’ ($r_s = 0.735, p = 0.000, n = 388$), respectively.

Further to this study, findings revealed that the ‘*number of tourists at a sighting*’ yielded moderately positive correlations with ‘*duration at a sighting*’ ($r_s = 0.419, p = 0.000, n = 388$) and ‘*harass wild animals*’ ($r_s = 0.540, p = 0.000, n = 388$). The ‘*number of tourists at a sighting*’ yielded moderate negative correlations with the wildlife category ($r_s = -0.420, p = 0.000, n = 388$) (Table 4.8).

Table 4.8: Observation Correlation matrix for Wildlife Viewers' Spatial Behaviour Patterns (n=388) (Source: Research Data, 2022)

Item	Observation Attributes		observations month	observation time	of tourists in the group	number of vehicles at a sighting	Overcrowding at a sighting	wildlife category	estimated distance from wildlife	duration at a sighting	driver respects other reserve users	Off-Road driving in restricted areas	game drive participants litter	harass wild animals	hooting/ making noise	Observes Speed Limit
	r_s	p -value														
1	Observations month	r_s	1.000													
		p -value	.													
2	Observation time	r_s	.200**	1.000												
		p -value	.000	.												
3	Number of tourists in the group	r_s	-.173**	-.168**	1.000											
		p -value	.001	.001	.											
4	Number of vehicles at a sighting	r_s	-.246**	-.210**	.900**	1.000										
		p -value	.000	.000	.000	.										
5	Overcrowding at a sighting	r_s	-.228**	-.182**	.735**	.804**	1.000									
		p -value	.000	.000	.000	.000	.									
6	Wildlife category	r_s	.260**	.181**	-.420**	-.465**	-.430**	1.000								
		p -value	.000	.000	.000	.000	.000	.								
7	Estimated distance from the wildlife	r_s	.320**	.225**	-.323**	-.374**	-.372**	.422**	1.000							
		p -value	.000	.000	.000	.000	.000	.000	.							
8	Duration at a sighting	r_s	-.139**	-.215**	.419**	.491**	.526**	-.534**	-.388**	1.000						
		p -value	.006	.000	.000	.000	.000	.000	.000	.						
9	Driver respects other reserve users	r_s	-.047	-.025	-.341**	-.382**	-.338**	.195**	.150**	-.126*	1.000					
		p -value	.353	.620	.000	.000	.000	.000	.003	.013	.					
10	Off-road driving in restricted areas	r_s	-.179**	-.280**	.188**	.244**	.294**	-.322**	-.381**	.344**	.021	1.000				
		p -value	.000	.000	.000	.000	.000	.000	.000	.000	.684	.				
11	Game drive participants litter	r_s	.098	.058	.088	.077	.096	-.060	-.106*	.120*	.044	.058	1.000			
		p -value	.053	.251	.082	.129	.059	.236	.038	.018	.384	.255	.			
12	Harass wild animals	r_s	-.191**	-.145**	.540**	.595**	.654**	-.429**	-.465**	.487**	-.332**	.418**	.034	1.000		
		p -value	.000	.004	.000	.000	.000	.000	.000	.000	.000	.000	.510	.		
13	Hooting/ making noise	r_s	.106*	.004	.366**	.362**	.342**	-.174**	-.161**	.238**	-.298**	-.032	.018	.320**	1.000	
		p -value	.037	.934	.000	.000	.000	.001	.001	.000	.000	.531	.721	.000	.	
14	Observes the speed limit 50 kph	r_s	-.071	.102*	.153**	.110*	.078	-.036	.022	.063	-.034	.037	.018	.058	.115*	1.000
		p -value	.162	.046	.003	.031	.126	.480	.662	.216	.503	.472	.728	.254	.024	.

No correlation- Do not Reject H_0

Very weak correlation- Reject H_0

Weak Correlation – Reject H_0

Moderate Correlation – Reject H_0

Strong Correlation – Reject H_0

In addition to the above results, the '*number of tourists at a sighting*' had a weak negative relationship with '*estimated distance from wildlife*' ($r_s = -0.323, p = 0.000, n = 388$), '*driver respects other reserve users*' ($r_s = -0.341, p = 0.000, n = 388$), and '*hooting/ making noise*' ($r_s = -0.361, p = 0.000, n = 388$). Last but not least, the '*number of tourists at a sighting*' did not correlate with '*wildlife/game drive participants litter*' (Table 4.8). From Table 4.8, study results indicate that '*the number of vehicles at a sighting*' strongly correlated with '*overcrowding at a sighting*' ($r_s = 0.804, p = 0.000, n = 388$). Further results showed '*number of vehicles at a sighting*' had moderate negative correlations with the '*wildlife category*' ($r_s = -0.465, p = 0.000, n = 388$). Two other moderate positive correlations were observed with '*duration at a sighting*' ($r_s = 0.491, p = 0.000, n = 388$) and '*harass wild animals*' ($r_s = 0.595, p = 0.000, n = 388$).

Two weak negative correlations were observed with '*estimated distance from wildlife*' ($r_s = -0.374, p = 0.000, n = 388$), and lastly, '*drivers respect other reserve users*' ($r_s = -0.382, p = 0.000, n = 388$). On the other hand, weak positive correlations were yielded between the '*number of vehicles at a sighting*' and '*off-road driving in restricted areas*' ($r_s = 0.244, p = 0.000, n = 388$), and '*hooting/ making noise*' ($r_s = 0.362, p = 0.000, n = 388$). '*Observes speed limit*' ($r_s = 0.110, p = 0.031, n = 388$) had a very weak correlation at a 95% confidence interval. Last but not least, '*wildlife viewers litters*' ($r_s = 0.077, p = 0.129, n = 388$) did not correlate with the '*number of vehicles at a sighting*'.

'*Wildlife viewers overcrowded at a sighting*' had one strong positive correlation with '*harass wild animals*' ($r_s = 0.654, p = 0.000, n = 388$). Another more moderate positive correlation was yielded with '*duration at a sighting*' ($r_s = 0.526, p = 0.000, n = 388$). On the contrary, '*overcrowding at a sighting*' had a moderate negative correlation with the '*wildlife category*' ($r_s = -0.430, p = 0.000, n = 388$). Further to these findings, '*overcrowding at a sighting*' had two weak negative correlations with '*estimated distance from wildlife*' ($r_s = -0.372, p = 0.000, n = 388$) and '*driver respects other reserve users*' ($r_s = -0.338, p = 0.000, n = 388$). In addition to these findings, '*overcrowding at a sighting*' had weak correlations with '*off-road driving in restricted areas*' ($r_s = 0.294, p = 0.000, n = 388$) and '*hooting/ making noise*' ($r_s = 0.342, p = 0.000, n = 388$). Lastly, '*overcrowding at a sighting*' did not correlate with '*wildlife viewers litters*' ($r_s = 0.096, p = 0.059, n = 388$), and '*observes speed limit*' ($r_s = 0.078, p = 0.126, n = 388$) (Table 4.8).

Study findings on how the '*wildlife category*' correlated with other observational attributes yielded moderate, weak, very weak, to no correlations. The '*wildlife category*' had a moderate positive correlation with '*estimated distance from wildlife*' ($r_s = 0.422, p = 0.000, n = 388$). '*Duration at a*

sighting' ($r_s = -0.534, p = 0.000, n = 388$) and *'harass wild animals'* had moderate negative correlations with the *'category of wildlife'* ($r_s = -0.429, p = 0.000, n = 388$). The *'category of wildlife'* registered one weak negative correlation with *'off-road driving in restricted areas'* ($r_s = -0.322, p = 0.000, n = 388$) (Table 4.8 Above). A very weak positive correlation was observed with *'driver respects other reserve users'* ($r_s = 0.195, p = 0.000, n = 388$). Another very weak but negative correlation was noted with *'hooting and making noise'* ($r_s = -0.174, p = 0.001, n = 388$). The study results revealed that the *'category of wildlife'* did not have any relationship with *'wildlife viewers litters'* ($r_s = -0.060, p = 0.236, n = 388$) and *'observes speed limit'* ($r_s = -0.036, p = 0.480, n = 388$).

'Estimated distance from the wildlife' had a moderate negative correlation with *'harass wild animals'* ($r_s = -0.465, p = 0.000, n = 388$). The *'estimated distance from wildlife'* generated weak negative correlations with *'duration at a sighting'* ($r_s = -0.388, p = 0.000, n = 388$) and *'off-road driving in restricted areas'* ($r_s = -0.381, p = 0.000, n = 388$). Further to these findings, one very weak positive correlation was established with *'drivers respected other reserve users'* ($r_s = 0.150, p = 0.003, n = 388$). On the other hand, the *'estimated distance from wildlife'* had very weak negative correlations with *'wildlife viewers litters'* ($r_s = -0.106, p = 0.038, n = 388$) and *'hooting/making noise'* ($r_s = -0.161, p = 0.001, n = 388$). These results notwithstanding, *'estimated distance from wildlife at a sighting'* did not show any relationship with *'observance of speed limits'* ($r_s = 0.022, p = 0.662, n = 388$) (Table 4.8 Above).

'Duration at a sighting' had one moderate positive correlation with *'harass wild animals'* ($r_s = 0.487, p = 0.000, n = 388$). On the other hand, *'duration at a sighting'* had a moderate positive correlation with *'off-road driving in restricted areas'* ($r_s = 0.344, p = 0.000, n = 388$) and *'hooting/making noise'* ($r_s = 0.238, p = 0.000, n = 388$). *'Duration at a sighting'* had two very weak correlations at a 95% confidence interval, one being positive and another negative. These were *'driver respects other reserve users'* ($r_s = -0.126, p = 0.013, n = 388$), *'wildlife viewers litters'* ($r_s = 0.120, p = 0.018, n = 388$), respectively. Lastly, *'duration at a sighting'* did not correlate with *'observance of speed limits'* (Table 4.8 Above).

'Driver respects other reserve users' had weak negative correlations with *'harass wild animals'* ($r_s = -0.332, p = 0.000, n = 388$) and *'hooting/making noise'* ($r_s = -0.298, p = 0.000, n = 388$). The behaviour attribute that *'driver respected other reserve users'* did not correlate with *'off-road driving in restricted areas'* ($r_s = 0.021, p = 0.684, n = 388$), *'wildlife viewers litters'* ($r_s = 0.044, p = 0.384, n = 388$), and *'observes speed limit'* ($r_s = -0.034, p = 0.503, n = 388$). *'Off-road*

driving in restricted areas’ had a moderate positive correlation with *‘harassment of wildlife’* ($r_s = 0.418, p = 0.000, n = 388$). Other observational attributes such as *‘wildlife viewers litter’* ($r_s = 0.058, p = 0.255, n = 388$), *‘hooting/ making noise’* ($r_s = -0.032, p = 0.531, n = 388$), *‘observes speed limit’* ($r_s = 0.037, p = 0.472, n = 388$), did not correlate with *‘off-road driving to restricted areas’*. *‘Wildlife viewers litter’* did not have any correlations with *‘harass wild animals’* ($r_s = 0.034, p = 0.510, n = 388$), *‘hooting/ making noise’* ($r_s = 0.018, p = 0.721, n = 388$), and *‘observes speed limit’* ($r_s = 0.018, p = 0.728, n = 388$). *‘Harass wild animals’* had a weak positive correlation with *‘hooting/ making noise’* ($r_s = -0.320, p = 0.000, n = 388$) and no correlation with *‘observes speed limit’* ($r_s = -0.058, p = 0.254, n = 388$). Finally, *‘hooting/ making noise’* had a very weak correlation with *‘observance of speed limit’* ($r_s = -0.115, p = 0.024, n = 388$) (Table 4.8 above).

4.1.6 Strong Aspects of NI in MMNR

The study further established the strong aspects of NI in MMNR by using open-ended questionnaire items. NVivo 12 content and context analysis revealed nine thematic areas that show the strong points of NI in MMNR. These are wildlife (20.1%), conservation and park management (15.6%), tour guiding (15.1%), an amazing experience (9.2%), big five (9.0%), wildebeest migration (5.7%), visitor codes (5.6%), directional signage (5.1%), and lastly, roads and trails (3.1%) (Table 4.9 below).

Under the general wildlife theme (20.1%) was the abundance and diversity of wildlife, the wildebeest, cheetahs, and the 'tano bora' team of cheetahs that were excellent hunters and highly sought after by tourists and driver guides. Another key component identified and related to wildlife was the big five (9.0%) members: the lion, elephant, leopard, buffalo, and black rhino (Table 4.9). Also related to the general wildlife theme was the wildebeest migration (5.7%), the annual spectacle in the MMNR occasioned by thousands of wildlife crossing the Mara River from the Serengeti in Tanzania back into the MMNR (Table 4.9). Wildlife-related themes, wildlife, the big five, and the wildebeest migration accounted for about 34.8% of the strong points of NI in MMNR.

Migration is one of the main high-season attractions in the MMNR, especially at river crossings. On approaches of NI tour guiding emerged top 15.1% mentions (Table 4.9). These results notwithstanding, respondents noted that NI in MMNR was an amazing experience with over 9.2% weighted remarks. Visitor codes and directional signage, as other NI approaches used in MMNR, had 5.6% and 5.1%, respectively. Indeed collectively, forms of NI had 19.9% mentions in this questionnaire item that sought to establish the strong points of NI in MMNR. Last on this list of

Table 4.9: Strong Aspects of NI in MMNR

<i>Item No.</i>	<i>Theme</i>	<i>Contextually related words</i>	<i>Frequency</i>	<i>Weighted percentage</i>
1	Wildlife	abundant, animals, biodiversity, bird, buffalo, cheetah, density, The big five, diversity, game, herds, Impala, insects, nature, plants, rich, species, <i>Tano Bora</i> cheetahs, variety, wild, Wildebeest, Wildlife.	255	20.1
2	Conservation and Park Management	Adaptations, administration, area, attraction, based, biodiversity, breeding, bush, care, conservation, controlled, defend, ecology, degradation, delivering, ecosystem, environment, especially, facilities, forges, gate, geographical, gives, greater grassland, great, greatest, guests, habitats, intrusion, identification, killing, lack, landscape, large, limiting, livestock, maintained, make, Mara, national, numbers, park, place, posterity, range, protection, provision, rangeland, regular, reception, relate, reserve, resources, scattered, scenery, scenic, survival, tourist, triangle, visitors.	249	15.6
3	Tour Guiding	certified, communication, curriculum, discipline, driver, drives, explain, Indigenous, intellectual, knowledge, local guides, professional, professionalism, tour guiding, understanding, vehicle.	209	15.1
4	Amazing Experience	amazing, beautiful, best, easy, emotional, enriching, expectations, experience, good, importance, interest, look, safari, satisfying, sightings, Unique, view, visibility, wonderful	145	9.2
5	Big Five	Big five, buffalos, cats, cubs, elephants, leopards, lions, rhinos,	118	9.0
6	Wildebeest Migration	Mara, river, migration, wildebeest, crossing, migratory, sightings	72	5.7
7	Visitor codes	adhered, behaviour, close, codes, come, comments, defaulters, dos, enforcement, fines, information, keep, language, observe, offenders, offenders, patrols, penalties, penalties, punitive, ranger, ranger, rules, strict, traditions, understood, unethical, unfamiliar	88	5.6
8	Directional Signage	assigned, better, directional, display, follow, 'kilo saba', main access route, point, signage, signs, usage, well	88	5.1
9	Roads and trails	access, allow, approaching, around, Better, connection, get, movement, respected, road, trails.	52	3.1
		TOTAL	1276	88.5
		Other general terms		11.5

(Research Data, 2022)

Under the general wildlife theme (20.1%) was the abundance and diversity of wildlife, the wildebeest, cheetahs, and the 'tano bora' team of cheetahs that were excellent hunters and highly sought after by tourists and driver guides. Another key component identified and related to wildlife was the big five (9.0%) members: the lion, elephant, leopard, buffalo, and black rhino (Table 4.9).

strong points of NI in MMNR were the roads and trails used in NI at MMNR, which had 3.1% mentions. The result implied that the roads and wildlife viewing trails at MMNR were not significantly a strong point of NI, which had three out of every hundred mentions.

Also related to the general wildlife theme was the wildebeest migration (5.7%), the annual spectacle in the MMNR occasioned by thousands of wildlife crossing the Mara River from the Serengeti in Tanzania back into the MMNR (Table 4.9). Wildlife-related themes, wildlife, the big five, and the wildebeest migration accounted for about 34.8% of the strong points of NI in MMNR. Migration is one of the main high-season attractions in the MMNR, especially at river crossings. On approaches of NI tour guiding emerged top 15.1% mentions (Table 4.9).

These results notwithstanding, respondents noted that NI in MMNR was an amazing experience with over 9.2% weighted remarks. Visitor codes and directional signage, as other NI approaches used in MMNR, had 5.6% and 5.1%, respectively. Indeed collectively, forms of NI had 19.9% mentions in this questionnaire item that sought to establish the strong points of NI in MMNR. Last on this list of strong points of NI in MMNR were the roads and trails used in NI at MMNR, which had 3.1% mentions. The result implied that the roads and wildlife viewing trails at MMNR were not significantly a strong point of NI, which had three out of every hundred mentions.

4.1.7 Weak Aspects of NI in MMNR

The research also sought to establish NI's weak aspects in MMNR. Qualitative study results yielded seven key areas that accounted for over 93% of mentions, as shown in Table 4.10 below. These are poor management of the vast reserve (23.22%), weak enforcement of rules (15.51%), tour guiding (13.21%), negative impacts (10.99%), few /poor signage, and lack of information centres (10.73%), lack of support amenities (9.92%), and lastly bad roads and trails (9.57%). The three were related to NI: tour guiding, weak enforcement of rules, few /poor signage, and lack of information centre, totalling 39.45%. Park management and conservation lack support amenities, and bad roads and trails had 42.71%. On the other hand, negative impacts, which is a function of weak points of NI and poor management and conservation at MMNR, had a 10.99%.

Poor reserve management (23.22%) emerged as the first key weak point hindering effective NI in MMNR (Table 4.10). Some of the respondents' concerns include uncontrolled grass burning, which is viewed as a careless and haphazard pasture management technique. Others comprised the illegal grazing and encroachment by the local community in MMNR and the uncoordinated implementation of reserve rules and regulations between the Mara Triangle and the Greater Mara

(see Appendix VII, Appendix VIII, Appendix IX). Management in these two areas exhibited different commitment levels in implementing NI strategies and providing necessary support infrastructure. The respondents also observed that in the Greater Mara, there was no priority in road repairs, signage, or ranger patrols for enforcement relative to the Mara Triangle

Table 4.10: Weak Aspects of NI in MMNR

<i>Item No.</i>	<i>Theme/ keyword</i>	<i>Contextually related words</i>	<i>Cumulative Frequency</i>	<i>Weighted percentage</i>
1	poor management of the vast reserve	animals, attractions, birds, botany, burning, camp, community, conditions, county, culture, diverse, ecosystem, emergency, environment, especially, established, food, game, gate, gem, grass, herbivores, home, huge, hyenas, identification, importance, insects, land, large, leopards, lions, livestock, Loosing, Maasai, major, management, Mara, migrating, migratory, money, nature, need, ostrich, outside, park, people, place, plains, plants, poor, pressure, priority, proper, question, rare, readily, reserve, river, poach, Sekenani, snakes, species, terrain, tourism, tourists, Triangle, uncoordinated, unnecessary, water, wild, wildlife	473	23.22
2	weak enforcement of rules	access, allow, behaviour, big, bribes, close, codes, control, corruption, discrimination, dos, enforcement, entry, false, favour, fines, flout, follow, law, limited, observe, open, park, patrol, penalized, penalties, rangers, regulations, respect, rules, sightings, Stop, strict, use, vehicles, Visitor, weak	328	15.51
3	Tour Guiding	arrogantly, biased, closer, cruisers, driven, driver, ethics, fellow, expectations, experience, female, French, friendly, frosty, German, give, Good, groups, guides, immunity, impunity, inexperienced, Job, Law, licenced, local, male, Masai, number, openly, private, Photography, pretext, professional, purporting, professionalism, recommended, registrar, retraining, tour, Trainee, training, treatment, tribe, unethical, unprofessional, untrained	285	13.21
4	negative impacts	abuse, bad, behaviour, bleeding, breach, breaking, cats, crowding, cut, damages, degradation, denying, destroying, destroying, dirty, disrupting, disturbance, encroachment, entering, excessive, feeding, going, grazing, guests, harassment, hard, hours, hunt, issues, July, littering, lost, many, marathon, nightmare, overcrowding, shaken, sites, status, swarming, time, timings, view, waste	238	10.99
5	few /poor signage and lack of information	appears, Arabic, assumption, awareness, care, centre, contacts, enough, expectations, five, found, help, idea, information, interpretation, key, knowledge, language, list, literature, look, number, online, picture, Points, possibly, public, relations, response, sensitization, signage, signage, sure, think, understand,	251	10.73

6	lack of support amenities	Accommodate, amenities, amenities, area, balloon , barrier, basic, behind, better, bins, boards, bridge, chairs, comfortable, equipment, facilities, infrastructure, insufficient, introduce, Keekerok , lack, lodges , Lookout , low, lunches, maintained, network, picnic, replacement, rooms, rusted, shades, small, spins, toilets , viewpoint , undesignated, uncomfortable, washrooms	185	9.92
7	Bad roads and trails	access, along, asphalt, better, vehicles, corridors, culverts, directional, display, distance, drive, driving, feeder tracks, geographical, impassable, laid, last, location, lot, sandy ravines, maintained, maintenance, map, marked, off-road, old paths, planning, rains, rescue, road, roads, rough, routes, sign, Talek, Territory, Tipilikwani, tracks, vehicles, Lookout , walk	217	9.57
Total			1977	93.15
Other words not considered			...	6.85

(Research Data, 2022)

. In this regard, the Greater Mara was perceived to have better management structures, and visible results made it look like a different destination, yet being part of the larger MMNR ecosystem administratively. These differing management structures brought about confusion and differing experiences and showed laxity on the part of The Greater Mara.

The respondents also noted few/poor signage and lack of information centre (10.73%) as the other weak aspect of NI in MMNR. A well laid out information centre, especially at the gate areas, was lacking, as opined by the respondents. Despite information being essential for visitors, responses indicated that they were either few, lacking, or unavailable in multiple languages. The wildlife viewers observed that the lack or inadequacy of the signage and information centres hindered information sharing and awareness creation that could facilitate understanding, public relations, and possibly responsible behaviour.

Indeed, reserve rules and regulations enforcement came second (15.51%) (Table 4.10 above). Sentiments such as the area being vast and therefore no effective enforcement. Where enforcement existed, the respondents noted favouritism, bribe-taking, corruption, or no strictness or fines by the rangers. In this regard, NI or visitor codes and enforcement did not manage to control the negative behaviour exhibited by wildlife viewers. Observations made by the researcher endorsed these sentiments. Due to ignorance or the belief that community guides and resident tour guides working for game lodges and tented camps were favoured by the rangers as regulars over visiting counterparts, local community guides violated reserve laws the most. These were observable cases

of wildlife viewers driving too close to wildlife, harassing wildlife, and not respecting others, especially at sightings. Other impacts included littering, off-road driving, overcrowding, excessive vehicle track marks due to off-roading, encroaching migration crossing points, trampling, and degrading vegetation.

Tour Guiding (with 13.21%) was third in the mentioned weak points of NI in MMNR. Some observable behaviour and attributes included unprofessional tour guides driving closer to wildlife. Some had foreign language deficiencies, and some flouted rules with impunity. Some were inexperienced, unlicensed, or had frosty relations with wildlife rangers, local guides, and visiting driver guides. Some respondents recommended retraining driver guides, especially local community guides who exhibited unprofessional conduct. Another weakness of NI in MMNR was the lack of support amenities (9.92%) to facilitate better wildlife viewing activities (Table 4.10 above). The most notable ones from responses were the lack of public washrooms at the Mara River crossing *Lookout/ Viewpoint*, the balloon landing area, and along the road stretching *Keekerok* lodge to Mara River bridge. Respondents believed that these amenities were to supplement those available at the entry points. The Mara River crossing '*Lookout*' also lacked pest-proof litter bins as a basic amenity and all-weather picnic tables and chairs at designated areas. To mitigate littering, the respondents proposed improving the existing amenities to make them comfortable and convenient for wildlife viewers in this expansive MMNR.

Last but not least was the existence of bad roads and trails (9.57%) that were irregularly maintained, thus hindering ease of access and comfortable wildlife viewing all year round (Table 4.10 above). A situation prevalent in *the Greater Mara*, especially during the rainy season, with the muddy and ungraded all-weather roads and nature trails becoming largely impassable or challenging to touring vehicles and groups. Some areas, like the balloon landing area, had impassable ravines and lugers when it rained. The major roads also lacked proper signage indicating junction numbers, directions, distances between points, or feeder tracks. Some Junctions had cluttered and overcrowded signage, especially at *Kilosaba* and the junction from *Sekenani* gate to *Talek* gate along '*route 24*'.

4.2 Discussion of Results

4.2.1 Effects of Demographic Characteristics on Behaviour

Generally, study findings established positive attitudes on NI's effect on regulating visitors' behaviour within MMNR. Findings revealed that respondents were more enlightened about nature and wildlife after interacting with different NI approaches. These results endorsed earlier research

indicating that NI enhanced visitor knowledge (Kuo, 2017; Marschall et al., 2017; PAPAGEORGIU, 2001; Powell & Ham, 2008). Indeed, knowledge is the foundational level for behaviour change regulation; an informed mindset will act more responsibly (Ching et al., 2019; Littlefair, 2003; Roberts et al., 2014). Study results further indicated that wildlife viewers got a satisfying experience, supported NI efforts, acted responsibly not to impact attractions, observed visitor codes and directional signage, and financially supported conservation areas. These results agreed with findings from other scholars (Ching et al., 2019; D'Antonio & Monz, 2016; Marschall et al., 2017; Švajda et al., 2018). These were endorsements of the role NI had in positively shaping the behaviour of wildlife viewers, as supported by earlier research (Juma et al., 2020; Xu & Fox, 2014)

On the other hand, negative attitudes were minimal. These NI made wildlife viewers observe visitor codes and directional signage and enlightened respondents about nature and wildlife (Figure 4.8). This finding implied NI may not always be effective when poorly executed (Fang et al., 2021; Mayorga et al., 2017; Sim et al., 2018). Therefore, diligence and consistency become imperative in implementing NI strategies that eventually deliver long-term benefits to a destination (Ching et al., 2019; Roberts et al., 2014). Ambivalence was least on NI, making wildlife viewers more enlightened about wildlife. Indeed, this result was expected as most respondents agreed that NI enhanced their knowledge of wildlife.

Results from Table 4.1 implied that some of the respondents' demographic characteristics never affected the behavioural responses. This finding echoes the work of other scholars that regardless of the touristic season, nationality, age, gender, level of education, or type of vehicle used, NI is implemented uniformly across the board (Juma & Khademi-Vidra, 2022; Song et al., 2021). This finding implies that the implementation of NI is applicable in and out of season without any discrimination because it was not significantly affected by the visitor demographic characteristics; that is, the month of visit, nationality, gender, age, education level, and type of vehicle used. The correlation with the purpose of the visit ($r_s = 0.093$) was negligible at a 95% confidence interval. These notwithstanding a very weak positive correlation, the visit's purpose affected NI's ability to make wildlife viewers act responsibly and not negatively impact attractions. This result was predictable as the purpose of the visit implied a level of mindfulness and connectedness with the destination and its attributes, thus compelling responsible behaviour or otherwise (Juma & Khademi-Vidra, 2022; Kuo, 2017; Poudel & Nyaupane, 2017; Prathumthin et al., 2021; Whitburn et al., 2020).

Study results revealed weak inverse relationships between wildlife viewers' support for NI efforts and the month of visit, age, and type of vehicle used. This finding indicated that as the months of the year advanced into the high season, a gradual decrease in support for NI was observed and vice versa. For instance, research by Grace et al., (2017) observed that drivers generally drove faster in the high tourist season than in the low season. For the case of MMNR, this could be attributed somewhat to the excitement of the wildebeest migration and associated prey and predator wildlife interactions in the MMNR that made visitors forget to act responsibly.

Similarly, as the age of the respondents increased, the support for NI waned; this was a strange observation. However, it could be attributed to the fact that the young were more informed on contemporary conservation issues and thus supported NI efforts, albeit marginally (Whitburn et al., 2020). The same trend was reported for the type of vehicle used, ranging from self-drive on an ordinary car to self-drive on a tour-equipped vehicle, driver-guide with a company-equipped vehicle, and a local freelance guide with a tour-equipped vehicle. Visitors on regular self-drive vehicles were more supportive of nature interpretive services, with the local freelance driver guides being the least supportive. Most responses on the weak points of NI in MMNR echoed this situation. These findings explicitly contradicted earlier researchers that opined that knowledgeable tour guides were most likely to exhibit and influence responsible behaviour (Alazaizeh et al., 2019; Kabii, Wandaka, Wamathai, et al., 2019; Poudel & Nyaupane, 2017; Weiler & Walker, 2014).

On the other hand, nationality and purpose of the visit had a very weak positive correlation with the wildlife viewers supporting NI efforts (Table 4.2 above). These findings implied a very weak direct relationship between nationality and the purpose of the visit and wildlife viewers supporting NI efforts. When one variable increased, the other increased to a very weak extent; however, the confidence interval was 95%, which implied negligible correlations. In addition to these findings, gender and level of education did not correlate with wildlife viewers supporting NI efforts, results that were contrary to popular opinion (Poudel & Nyaupane, 2017; Whitburn et al., 2020). Very weak negative correlations implied a very weak indirect relationship between financial support for conservation areas and nationality or purpose of visit. This result partially endorsed earlier research on factors influencing willingness to financially support conservation initiatives (Cárdenas & Lew, 2016).

However, the month of visit, gender, age, education level, and type of vehicle used did not correlate with wildlife viewers who were not motivated by NI to support conservation areas financially. These correlational results conflicted largely with findings by Cárdenas and Lew (2016), Poudel

and Nyaupane (2017), and Whitburn et al., (2020). NI gave wildlife viewers a satisfying experience and revealed two very weak negative correlations with the month of visit and education level; these were very weak inverse correlations; as one variable increased, the other decreased. These findings loosely echoed the observations by earlier research where NI enhanced visitor satisfaction from one season to another and across the scope of knowledge and education level (Goh & Rosilawati, 2014; Huang et al., 2015; Wang, 2015). However, on the flip side, NI gave wildlife viewers a satisfying experience that did not correlate with nationality, gender, age, the purpose of visit, and the type of vehicle used. In essence, NI gave wildlife viewers a satisfying experience that yielded very weak or negligible correlations or no correlations with most demographic characteristics.

Table 4.11: Objective one: Null Hypothesis testing summary matrix

No.	Behaviour attribute	Tour guide competency or delivery	
		(correlated) Reject null hypothesis	(Did not correlate) Accept null hypothesis
1	<i>'are more enlightened about nature and wildlife.'</i>	A	B, C, D, E, F, G
2	<i>'act responsibly not to impact attractions'</i>	A	B, C, D, E, F, G
3	<i>observe visitor codes and directional signage</i>	A	B, C, D, E, F, G
4	<i>supports NI efforts</i>	A, C, D, F, G	B, E
5	<i>financially supports conservation areas</i>	A, G	B, C, D, E, F
6	<i>get a satisfying experience</i>	A, B, C, D, G	E, F

- KEY:**
- A- Type of Vehicle Used
 - B- Age
 - C- Month of visit
 - D- education level
 - E- the purpose of the visit
 - F- Nationality
 - G- Gender

(Research Data, 2022)

The study sought to establish if the wildlife viewers, demographic characteristics influenced the behaviour exhibited in MMNR. Study results yielded mixed correlations between behaviour attributes and the demographics of wildlife viewers; thus, the hypothesis was partially not rejected (Table 4.11). These findings, notwithstanding most of these correlations, were very weak and marginal. For the behaviour attributes, NI enlightened wildlife viewers more about nature and wildlife, acted responsibly not to impact attractions, and followed visitor codes and directional

signage correlated with the type of vehicle used; thus, the null hypothesis was rejected. On the other hand, age, the month of visit, education level, purpose of visit, nationality, and gender did not correlate with wildlife. Viewers became more enlightened about nature, acted responsibly, and followed visitor codes and directional signage; the null hypothesis was not rejected.

Behaviour attributes wildlife viewers supported NI efforts correlated with the type of vehicle used, gender, nationality, month of visit, and education level. Therefore, the null hypothesis was rejected. On the hand, wildlife viewers supported NI efforts that did not correlate with age and the purpose of the visit, and thus the null hypothesis was not rejected. A very weak relationship was established between the type of vehicle used and gender versus wildlife viewers' financial support for conservation areas. In this regard, the alternate hypothesis was adopted. However, after interacting with NI, the age, month of visit, education level, purpose of visit, and nationality did not correlate or affect wildlife viewers' financial support for conservation areas. Thus the null hypothesis was not rejected for these demographic characteristics.

Last but not least, nationality and the purpose of the visit influenced wildlife viewers to get a satisfying experience after interacting with NI. Therefore, the alternate hypothesis was adopted for these two visitor demographics. On the other hand, age, the month of visit, education level, nationality, gender, and the type of vehicle used did not influence wildlife viewers' ability to get a satisfying experience after interacting with NI. Consequently, the null hypothesis was adopted for age, the month of visit, education level, nationality, gender, and the type of vehicle used.

4.2.2 Effect of Tour Guiding Delivery on Wildlife Viewers' Behaviour

Study results indicated that generally, tour guides received affirmations from respondents ranging from 78.2% to 58.1%. '*Tour guides had a good understanding of wildlife*' (78.2%), '*tour guides had good tour guiding skills*' (73.4%), '*tour guides provided enlightening NI*' (71.1%), and '*tour guides communicated visitor codes/dos and do nots*' (64.6%). Because the tour guide competency attributes were framed in the positive, these affirmations thus primarily endorsed that tour guides in MMNR were competent in executing their duties and responsibilities, notwithstanding the ambivalence rate ranging between 15.1% to 27.4%. These results concur with the findings made by Borges (2016), Kabii et al., (2019), Makopo et al., (2018), and Panca Syahputra (2017), which underscore the role of tour guiding in visitor management at the destination level.

Ambivalence was highest on the attribute '*tour guides required regular interpretational training and sensitisation*'(27.4%). Despite underlining the need for retraining, a result implied that

respondents were not sure of tour guides' training backgrounds. Secondly, it can be argued that refresher courses should be considered a standard practice to ensure tour guides keep abreast of new developments, enhance professionalism, and competent execution of tour guiding roles (Alazaizeh et al., 2019; Kabii, Wandaka, & Jilo, 2019; Prakash & Chowdhary, 2010). Indeed, negative attitudes for all the dummy variables for tour guiding competencies and skilling were very low and ranged between 6.5% and 14.5%. A clear indication that most respondents generated positive attitudes after getting NI from tour guides in MMNR.

Table 4.12: Objective two; Null hypothesis testing summary matrix

No.	Behaviour attribute	Tour guide competency or delivery	
		(correlated) null hypothesis	Reject (No correlation) Accept null hypothesis
1	<i>are more enlightened about nature and wildlife</i>	A, B, C, D, E, F	-
2	<i>act responsibly not to impact attractions</i>	A, B, C, D, E, F	-
3	<i>observe visitor codes and directional signage</i>	A, B, C, D, E, F	-
4	<i>supports NI efforts</i>	A, B, C, D, F	E
5	<i>financially supports conservation areas</i>	A, B, C, D, E, F	-
6	<i>get a satisfying experience</i>	A, B, C, D, E, F	-

KEY:

- A- Tour guides communicate 'do's and do not's.'
- B- Tour guides have a good understanding of wildlife
- C- Tour guides have good tour guiding skills
- D- Tour guides provide enlightening NI
- E- Tour guides require regular interpretation training and sensitisation visitor
- F- Codes and signage are communicated to tourists by tour guides

(Research Data, 2022)

A spearman's correlation test was done to assess the relationships between the tour guide competencies and the behaviour exhibited by wildlife viewers and consequently test the hypothesis. Study results indicate that tour guides require regular interpretation training, and sensitisation had a very weak positive correlation with the behaviour exhibited by wildlife viewers. This finding could be attributed to the question being more of a recommendation for further tour guide training. As such, it never directly impacted the attitudes and significantly shaped the behaviour of wildlife viewers. This argument notwithstanding, tour guide training enhances the skilling and competencies necessary for their tour guiding roles (Prakash & Chowdhary, 2010).

Similarly, wildlife viewers '*financially supported conservation areas*' had very weak positive correlations with all the tour guide delivery attributes. The only exception was visitor codes '*are*

communicated to tourists by tour guides’ that correlated weakly with *‘wildlife viewers financially supported conservation areas.’* Second in the ranking was *‘wildlife viewers acting responsibly, not impacting attractions’*, which had split results between very weak and weak correlations. Wildlife viewers *‘become more enlightened about nature and wildlife, ‘observe visitor codes and directional signage’, ‘get a satisfying experience, and support NI efforts’*; all had five weak positive correlations with *‘tour guides communicating do’s and do nots’, ‘have a good understanding of wildlife’, ‘have good tour guiding skills’, ‘provide enlightening NI’*, and *‘tour guides communicated visitor codes are to tourists.’* All the attributes again registered a very weak positive correlation with *‘tour guides required regular interpretation training and sensitisation’* except for *‘wildlife viewers supported NI efforts’*, which did not correlate.

Generally, weaker positives existed than the number of very weak positive correlations. The results implied that tour guiding had a weak direct relationship with the behaviour exhibited by wildlife viewers in MMNR. Consequently, other factors besides tour guiding delivery might also have contributed to the behaviour exhibited by wildlife viewers and are not limited to different approaches to NI, that is, visitor codes, maps, and orientation signage or visitor information centres. These notwithstanding, the recommendation that tour guides require refresher training and sensitisation very weakly affected the behaviour exhibited by wildlife viewers. These weak and very weak correlations notwithstanding, the study results concur with results from earlier research in other parts of the world in similar environments (Cárdenas & Lew, 2016; Kabii, Wandaka, Wamathai, et al., 2019; Poudel & Nyaupane, 2017; Whitburn et al., 2020).

Further to these findings, the study sought to establish the respondents' views on whether there was a need for a new training curriculum for tour guides in MMNR. Study results indicated that about 45.8% of the respondents okayed the development of a new tour guide training curriculum in MMNR. 32.1% were unsure, and 22.1% did not support it (Figure 4.13 above). The high level of ambivalence could be because many were unsure what it entails to be a tour guide, the training background of the tour guides, or that they could not competently evaluate the tour guide delivery over a short period of interaction. The respondents’ recommendation for a new training programme endorsed findings by Kabii, Wandaka, and Jilo (2019) and Kabii, Wandaka, Wamathai, et al., (2019), that opine that tour guide training enhances their competencies.

The null hypothesis that tour guiding delivery does not affect the behaviour exhibited by wildlife viewers was primarily rejected for most behaviour attributes, as summarised in Table 4.12 above. Wildlife viewers are more enlightened about nature and wildlife, act responsibly not to impact

attractions, observe visitor codes and directional signage, financially support conservation areas, and get a satisfying experience. These behaviour attributes were observed to have very weak to weak correlations with the dummy attributes that represented tour guide training competencies, and thus the alternate hypothesis was adopted.

On the other hand, wildlife viewers supporting NI efforts did not correlate with one attribute of tour guide training and competencies. Tour guides require regular interpretation training and sensitisation where the null hypothesis was not rejected. Nevertheless, it correlated with the other tour guide training and competencies attributes. Thus, the alternative hypothesis was adopted for tour guides to communicate ‘do's and do not's’. Tour guides have a good understanding of wildlife, tour guides have good tour guiding skills, tour guides provide enlightening NI, and codes and signage are communicated to tourists by tour guides.

4.2.2.1 Proposed thematic areas for new training curriculum insitu

The qualitative data from the open-ended questionnaire item, 'what topics or thematic areas should be included in a new training curriculum for tour guides at MMNR?', was analysed using NVivo 12 to establish the themes and weighted word frequencies for the thematic areas. Qualitative data revealed six vital thematic areas ranked by their respective weighted frequencies, as detailed in Table 4.13 below. These were professional codes of conduct and laws regulating tour guiding, customer care and public relations, identification, natural history, distribution of wildlife, wilderness navigations, safety, and survival techniques. In addition to these, other topics were wildlife behaviour and managing wildlife encounters, conservation, and protected area management.

Table 4.13: proposed tour guide training curriculum weighted themes and

	Topic	Weighted Percentage
1	Laws regulating tour guiding and professional code of conduct	28.97
2	Customer care and public relations	19.24
3	Natural history, identification, and distribution of wildlife	18.12
4	wilderness navigations, safety, and survival techniques.	15.51
5	Wildlife behaviour and Managing wildlife encounters	9.65
6	Conservation and protected area management	7.95
	Total	99.4

(Research Data, 2022)

The other topics respondents identified during the study were professional code of conduct and laws regulating tour guiding (28.97%) (Table 4.13 above). Despite respondents' attitudes from study findings in Figure 4.9 above implying that tour guides were competent in discharging their duties, the qualitative results indicated room for continual improvement. Good professional training and meeting appropriate practising requirements stipulated in Kenyan laws and statutes become the starting point for all tour guides in MMNR (Kabii et al., 2017; The Tourism Act, 2011).

Further, responses alluded that professional conduct and etiquette during the discharge of tour guiding duties and responsibilities would create a favourable destination image and ensure visitor satisfaction and repeat business, if not referrals. Understanding the wilderness code of ethics and conduct and applying and or clearly explaining the do's or the do nots and their rationale to tourists is critical in destination visitor management. As endorsed by Liu et al., (2021), Nejmeddin (2020), Poudel and Nyaupane (2013), (2017), and Prakash and Chowdhary (2010), a training and awareness creation on the laws regulating tour guiding, codes of conduct, and ethics will be essential to ensure professionalism in tour guiding. In this regard, the number of untrained practising guides within the MMNR will gradually reduce. These facts notwithstanding, the researcher opines that ranger patrols and strict enforcement would guarantee overall compliance with the visitor codes and other conservation ethics. It was noticeable that local community guides were the most ignorant and deviant when following the reserve rules and regulations. They were just keen on pleasing visitors by even unorthodox wildlife viewing practices. In this regard, the focus should be on regulation through their association, training, and sensitization of MMNR community guides.

Study results showed that customer care and public relations had the second-highest ranking (19.24%). It implied that respondents viewed general NI as an essential service to visitors at the MMNR. Therefore, more attention should be given priority to NI as a service to visitors that will guarantee comfort, satisfaction, and ultimately positive word of mouth and repeat business, a concern that has been observed as necessary by other researchers (Kabii et al., 2017; Mohamadkhani & Ashrafi, 2013; Mutiaraningrum et al., 2021; Vij & Upadhya, 2021). It is vital to note that customer care and public relations are also at the core of NI (Lück & Porter, 2018). Indeed, customer care entails providing services to clients during and after a visit or purchase, whereas public relations involve creating, distributing, and disseminating messages to raise positive awareness. Therefore, good customer service and visitor information through NI will

enable visitors to enjoy themselves, get a memorable experience, and act more responsibly as they would have known what is expected of them (Carmody, 2013; Lück & Porter, 2018; Vij & Upadhyaya, 2021). Therefore, the providers of NI, the tour guide, should be taught how to handle their clients to deliver these benefits at a destination level like MMNR. Therefore, the proposed tour guide training programme should give more weight to customer care and public relations (about 19% of the curriculum content and time) as a cornerstone of NI in MMNR.

Third in the ranking was natural history, identification, and distribution of wildlife (18.12%) (Table 4.13 above). The Mara ecological plains are well-known as a hotspot for biodiversity. About a quarter of Kenya's wildlife is in the MMNR ecosystem. It is home to over 95 mammal species and is an Important Bird Area (IBA) with over 550 bird species (Masai Mara Wildlife Conservancies Association (MMWCA), 2022). Therefore, the Masai Mara ecosystem is noted for having the highest density and most diversified combination of large herbivores, like the wildebeests, which are known for their seasonal migration between the Masai Mara and Serengeti well as between the conservancies and the Loita plains (Bhandari, 2014; Juma & Khademi-Vidra, 2022; Onchwati et al., 2010). Knowledge in the identification, behaviour, distribution and other unique facts about these diverse biodiversity forms part of the critical subject matter for explaining the why, what, when, or why things are the way they are, also referred to as NI (Carmody, 2013; Shidende et al., 2019). Nature interpreters need to have a sound knowledge of wildlife in MMNR. Visitor experiences are enriched not only by the sightings of large wildlife or the highly sought-after big cats or the big five (African elephant, cape buffalo, lion, leopard, and rhino) but also by their information documented in book and print, signages, electronic media, or packaged by tour guides during NI.

Another thematic area from the qualitative data analysis was wilderness navigation, safety, and survival techniques (Table 4.13 above). It is essential for nature interpreters and facilitators like rangers and tourism officers to quickly find the way around the reserve for an effective, efficient, and enriching NI experience. Wilderness navigations, safety, and survival techniques are vital for coping with challenging situations within this remote reserve without endangering themselves or the ecosystem (Saeedi et al., 2010; Shimokihara et al., 2021; S. Yang & Hsu, 2016). Navigation could be guide maps, digital or print media, and natural features. Wilderness navigations, safety, and survival techniques are vital for tour guides, not just for safety but also for saving time within this vast ecosystem known as MMNR.

Some minor wildlife trails are not marked because installing excessive signage, and display boards within MMNR could easily lead to visual pollution; neither trail surfaces are hardened to facilitate the ease of driving vehicles. Therefore, given these pristine wilderness conditions, the chances of getting lost or getting stuck in mud in MMNR, which has numerous natural springs in the grasslands and wetlands ravines, are very high. Therefore, having good wilderness navigation skills will ensure successive and hassle-free wildlife viewing experiences while in the wilderness (Kabii et al., 2017; Shimokihara et al., 2021; S. Yang & Hsu, 2016).

Common challenges at wildlife sightings are an accurate understanding and anticipating of wildlife behaviour and consequently effectively managing these wildlife encounters for visitor satisfaction without harassing or endangering wildlife and ensuring other reserve users are satisfied without putting anyone at risk. Wildlife tends to be quite unpredictable, but a clear understanding of their behaviour and psychology will enable sighting them quickly, anticipating their behaviour, and acting responsibly (Borges, 2016; Walker & Weiler, 2017). It is common to see wildlife viewers harassing animals, driving too close, blocking their paths for better filming and photography, sitting on vehicle rooftops, using flashing cameras, making noise, or approaching large wildlife and big cats head-on instead of from the sides (Dell'Eva et al., 2020; Kim & Binti, 2021; Walker & Weiler, 2017). All these constitute potentially risky situations that can endanger wildlife viewers. Tour guides require training on wildlife behaviour and psychology and effectively managing wildlife encounters at sightings. Whereas wildlife tends to shy away from humans, how wildlife viewers approach them can trigger fight or flight instincts in wild animals, worsening the wildlife viewing experience and threatening reserve users.

In this list also was conservation and protected area management. As users of MMNR for touristic purposes, tour guides require a basic understanding of conservation and park management to enable tour guides to provide quality NI and better understand what park management entails. Tour guides are vital stakeholders in visitor management because, on tourists' holidays, tour guides are some of the tourism sector staff that spend much time with visitors. As such, they not only act as destination ambassadors but provide a link and a personal touch that is critical in behaviour regulation as destinations (Hurdle, 2019; Liu et al., 2021; Lóczy & Ciglić, 2018).

Therefore, tour guides need an understanding of their role in a park or destination management as critical stakeholders. Tour guides can pass on this conservation ethics to their clients, particularly wildlife viewers (Irimiás et al., 2021; Kabii, Wandaka, Wamathai et al., 2019; Poudel & Nyaupane,

2013; Topler et al., 2017). Six broad training areas were identified and weighted by the preceding recommendations for a new tour guide training short course, as detailed in Table 4.13.

4.2.3 Effect of Non-Personal NI on Behaviour Exhibited

The study sought to establish how non-personal forms of NI affect the behaviour exhibited by wildlife viewers at MMNR. The display boards were more noticeable than the visitor codes or information centres. This finding was against the backdrop that visitor information and regulatory communication are critical in visitor management, as supported by many researchers (Allbrook & Quinn, 2020; Gosal et al., 2021; Saunders et al., 2019). Despite these important observations, it was evident that visitor information points or centres were very few and explicitly deficient at most key locations. In this regard, non-personal forms of NI that were less conspicuous should be scaled up, unlike tour guiding, which took a prominent pedestal in NI.

These observations aside, study findings revealed that existing visitor codes, display boards, and directional signage were easy to read and understand and had the highest favourable ratings. Second in the ranking were visitor codes, display boards, and directional signage communicated to tourists by tour guides. Visitor codes, display boards, and directional signage are appropriate in size and visible had a simple majority of affirmations. Visitor codes, display boards, and directional signage are strategically located and have marginal positive results. Visitor codes, display boards, and directional signage are too many and have more dissenting views. Borges (2017), Ching et al., (2019), and Marschall et al., (2017) observe that regardless of the avenue for dissemination of visitor information and nature or cultural interpretation, the diversity and integrated application of these soft VMS will more effective collectively than over-relying on any of them.

Despite these arguments, the favourable study results implied that the few existing visitor codes, display boards, and directional signage were well designed and presented using appropriate size, location, visibility, and legibility. There was room for improvement as most respondents believed that the visitor codes, display boards, and directional signage were few (56.1%), with another 25.8% being neutral and a paltry 18.1% being affirmative that they were many. The results showed that more visitor codes, display boards, and directional signage were needed, especially the few visitor information centres and codes.

Generally, possible reasons for wildlife viewers not observing visitor codes and orientation signage ranked as follows; pressure from tourists for better views and photography (77.2%), desire

to get tourists a memorable experience (71.8%). Ignorance of the consequences of disregarding the visitor codes (46.5%) stood out with relatively high scores (Table 4.5). These results portrayed the need for stricter patrols and enforcement of visitor codes in the short term, more awareness among wildlife viewers, and regular tour guide training and workshops. More stringent enforcement was envisaged to bring sanity in the short-term (Albrecht, 2017; Hughes and Morrison-Saunders, 2005; Littlefair, 2003). Like in the Mara Triangle, these strategies should be implemented in the Greater Mara, especially during the high tourist season. Punitive measures were also observed to work in the Mara Triangle and should be replicated in the Greater Mara (see Appendix VII, Appendix VIII). The general public having innovatively attractive visitor information centres at the gate will help create awareness before checking into the MMNR.

On the other hand, regular training and workshops with the tour guides will enhance long-term professionalism and commitment to conservation. The study recommends that tour guides be members of tour guide associations as stipulated by Kenya's tourism law and licensing regulations (the Republic of Kenya, 2013; The Tourism Act, 2011) to efficiently manage waywardly notorious tour guides.

4.2.3.1 Objective Three: Correlations and Hypothesis Testing

Correlations results on field observation attributes were majorly weak and positive. However, a few moderate and very weak correlations were observed in Table 4.8 and Table 4.14. Study results indicated that behaviours attributed to wildlife viewers 'being more enlightened about nature and wildlife and 'financially supporting conservation areas' largely had weak correlations with all the dummy attributes of non-personal forms of NI. The behaviour attributes of wildlife viewers being '*more enlightened about nature and wildlife*' correlated with all the dummy variables for non-personal forms of NI. These were visitor codes, display boards and orientation signage '*were too many*', '*are strategically located*', '*they are of appropriate size and visible*', '*are easy to read and understand*', and they '*are communicated to tourists by tour guides*' (Table 4.14 below).

In this regard, the null hypothesis that there is no correlation between the non-personal form of NI and the behaviour exhibited by wildlife viewers was rejected (Table 4.14). The alternative hypothesis was thus adopted because there was a relationship between non-personal forms of NI and the behaviour exhibited by wildlife viewers in MMNR. These findings demonstrated the importance of non-personal kinds of NI in equipping wildlife viewers with the knowledge that ultimately influences good behaviour at a location (Ababneh, 2017; Ballantyne et al., 2009; Hanson et al., 2019; Tanalgo & Catherine Hughes, 2021; van der Merwe et al., 2020). There were

correlations in the behaviour attribute that NI caused wildlife viewers to act responsibly and not to impact attractions.

This finding was evident with questionnaire items ‘*non-personal forms of NI are too many*’, ‘*are strategically located*’, ‘*are of an appropriate size*’ and ‘*are easy to read and understand*’, and that they ‘*are communicated to tourists by tour guides*’. From these correlations, the null hypothesis was rejected (Table 4.14). Instead, the alternative hypothesis was adopted because there was a relationship between non-personal forms of NI and the behaviour exhibited by wildlife viewers in MMNR. However, the behaviour attribute ‘NI made wildlife viewers *act responsibly and not impact attractions*’ did not correlate with visitor codes, and orientation signages ‘*are too many*’. As such, the null hypothesis was not rejected.

Table 4.14: Objective three Hypothesis Testing Summary Matrix

No.	Behaviour attribute	Non-personal forms of NI attributes	
		(correlated) null hypothesis	Reject (Did not correlate) Accept null hypothesis
1	are more enlightened about nature and wildlife	A, B, C, D, E	-
2	act responsibly not to impact attractions	B, C, D, E	A
3	observe visitor codes and directional signage	B, C, D, E	A
4	supports NI efforts	B, C, D, E	A
5	financially supports conservation areas	A, B, C, D, E	-
6	get a satisfying experience	B, C, D, E	A

KEY:

- Non-personal forms of NI are: -
- A. too many
 - B. strategically located
 - C. of appropriate size and visible
 - D. easy to read and understand
 - E. communicated to tourists by tour guides

Research Data, 2022)

Similar results were observed with behaviour attributes; ‘*wildlife viewers observe visitor codes and directional signage*’, ‘*support NI efforts*’, and ‘*get a satisfying experience.*’ All these behaviour attributes correlated with the questionnaire item non-personal forms of NI ‘*are too many*’, ‘*strategically located*’, ‘*appropriate size*’, ‘*easy to read and understand*’, and ‘*communicated to tourists by tour guides*’. In this respect, the null hypothesis was rejected for this attribute of non-personal forms of NI against wildlife viewers ‘*observed visitor codes and*

directional signage, *'supported NI efforts'*, and *'got a satisfying experience'*. It has been noted that when visitors do not know the consequences of their actions, threats of negative impacts are imminent, while on the contrary favourable actions are a consequence of an informed and adequately directed visitor traffic within a destination (Bhati & Pearce, 2017; Gulati, 2021; Marschall et al., 2017; Poudel & Nyaupane, 2017).

Last but not least, wildlife viewers *'supported NI efforts'* did not correlate with *'too many'* non-personal forms of NI (visitor codes, display boards, and directional signage). Therefore, the null hypothesis was not rejected for this attribute of non-personal forms of NI. Contrary to these, the other four attributes of non-personal forms of NI had weak positive correlations. They are strategically located, are of appropriate size and visible, are easy to read and understand, and are communicated to tourists by tour guides (Table 4.14). In this case, the null hypothesis was rejected.

Wildlife viewers' behaviour attributes, *'acting responsibly not to impact attractions'*, *'observing visitor codes and directional signage'*, *'supporting NI efforts'*, and *'getting a satisfying experience'* did not correlate with *'visitor codes, display boards, and directional signage were too many'*. The findings implied that the effectiveness of these non-personal forms of NI does not depend on the quantity of signage. Other scholars have endorsed this finding (Allbrook & Quinn, 2020; Ching et al., 2019; Marschall et al., 2017). Observed to be more critical were the non-personal forms of NI being strategically located, of appropriate size and visible, easy to read and understand, and communicated to tourists by tour guides.

4.2.3.2 Strong Points of NI in MMNR

The study sought to further establish the strong aspects of NI in MMNR by using open-ended questionnaire items. NVivo 12 content and context analysis revealed nine thematic areas that show the strong points of NI in MMNR. These included wildlife, park conservation and management, tour guiding, an amazing experience, the big five, wildebeest migration, visitor codes, directional signage, and roads and trails (Table 4.9 above). Under the general wildlife theme was the abundance and diversity of wildlife, the wildebeest, cheetahs, and the *'tano bora'* (excellent) hunting team of cheetahs that were highly sought after by tourists and driver guides.

Large wildlife like zebras, elands, buffalos and elephants were easily spotted from far, given their size and behaviour (Green et al., 2019; Juma et al., 2020; MMWCA, 2022). However, the lions, leopards, and rhinos were more elusive and thus highly sought by wildlife viewers because they easily camouflaged in the grass and scrub bush (Farr et al., 2019; Ghosh et al., 2019; Juma &

Khademi-Vidra, 2022). Masai Mara is one of the rich wildlife hotspots in Kenya, with a high density of many wildlife species tourists seek (MMWCA, 2022; Onchwati et al., 2010). Indeed, wildlife is the main object of NI in MMNR; the richer the biodiversity in an ecosystem, the more interesting the NI experience will be.

Among the approaches to NI, tour guiding was ranked first, with 15.1% of the mentions. It could be argued that tour guiding is the main form of NI in MMNR, given that majority of tourists (84%) visiting MMNR use driver guides, with only a small fraction (16%) on self-drive (Figure 4.7). MMNR, as an avast attraction in a remote location for visitation, requires an experienced driver cum guide to facilitate an enriching safari experience (Kabii, Wandaka, Wamathai, et al., 2019). These results notwithstanding, respondents noted that NI in MMNR was a fantastic experience (with over 9.2% weighted) mentions. A result that implied about nine in every one hundred people had an amazing experience with all the NI approaches used in MMNR. Researchers opine that an enriching wildlife tourism experience enhances visitor satisfaction (Huang et al., 2015; Kubo and Shoji, 2016; Oviedo-García et al., 2019; Wang, 2015), and indeed, MMNR is an amazing wildlife tourism destination that has earned the title of the eighth natural wonder of the world. Last on this list of strong points of NI in MMNR were the roads and trails used in NI at MMNR, which had 3.1% mentions. The result implied that the roads were not significantly a strong point of NI at MMNR, which had three out of every one hundred words.

From these findings, three broad themes emerged as the strong points of NI at MMNR. First in the ranking was wildlife with 34.8%, NI approaches were second with 19.9%, and conservation and Park Management (including roads and trails) was the other thematic area with 18.7% weighted average mentions. These three critical components of NI in MMNR delivered an amazing experience (9.2%, N=570) and formed the context of NI within nature-based destinations. Many scholars opine that professionally interestingly presenting NI information in a great environment will enhance visitor satisfaction and model positive behaviour towards wildlife amongst visitors (Borges and Ronda, 2017; Freeman et al., 2021; Knight, 2009; Mitchell & Ryland, 2020). Secondly, these results emphasise the role of park management authorities in creating a good environment for NI through diligent provision and management of park or reserve infrastructures like roads and trails, directional signage, conservation, provision of security, and other visitor regulatory mechanisms (Dunets et al., 2020; Grace et al., 2017; Grünewald et al., 2016). Indeed, without good access roads and nature tracking trails, directional signage, and visitor codes or signage, wildlife viewers would most likely not get good experiences and, in some cases, present

challenges of negative impacts. In the case of MMNR, the management strategies differed between The Greater Mara and the Mara triangle. Some scholars argue that all-weather roads limit access and therefore assist in reducing road kills due to overspending on vehicles, regulating the vehicular type and the tourist traffic visiting wilderness areas (Borges, 2017; Borges & Ronda, 2017; Grace et al., 2017; Grünewald et al., 2016). The poor roads thus indirectly defined the carrying capacity of a destination by vehicular capacity, type, and visitor numbers. Despite these arguments, the researcher opines that well-maintained roads network will enhance visitor experience and discourage off-road driving. Notably, some areas of the all-weather roads were muddy, and tour drivers were compelled to drive around them, necessitating offroad driving.

4.2.3.2 Weak Points of NI in MMNR

The research again sought to establish the weak aspects of NI in MMNR. Qualitative study results yielded seven key areas that accounted for over 93% of the mentions, as detailed in Table 4.10. These were poor management of the vast reserve, weak enforcement of rules, tour guiding, negative impacts, few /poor signage, lack of information centre, lack of support amenities, and bad roads and trails. Three were related to NI; tour guiding, weak enforcement of rules, few /poor signage, and lack of information centre, which totalled 39.45%. Park management and conservation lack support amenities, and bad roads and trails had 42.71%. On the other hand, negative impacts, caused by the weak points of NI and poor management and conservation at MMNR, had a 10.99%.

Poor reserve management emerged as the first critical weak point that hinders practical NI in MMNR. Some of the respondents' concerns included uncontrolled grass burning, which was viewed as a careless and haphazard pasture management technique. Conservationists have debated controlled pasture management by burning over the years with arguments for and against it (Valkó et al., 2016; Valkó & Deák, 2021). Most scholars opt for controlled livestock grazing and wildlife conservation (Huertas et al., 2021; Múgica et al., 2021), while others argue that nature should take its course instead of burning (Huertas et al., 2021; Múgica et al., 2021; Silva et al., 2020). MMNR being a national reserve managed like a park, such recommendations will not suffice ((Republic of Kenya, 2013, 2018; The Tourism Act, 2011)). Therefore, is controlled grazing an option to ponder as MMNR is a national reserve that should allow limited, non-consumptive resource utilisation by the community? This suggestion might create another e challenge as cattle incursions and encroachment by the local community have become a common menace and an eyesore to the tourists in MMNR.

Further to these challenges, the uncoordinated implementation of reserve rules and regulations between the Mara Triangle and the Greater Mara of the MMNR has resulted in differentiated experiences between the two areas of the same destination MMNR. The management in these two areas of MMNR exhibited different commitment levels in implementing NI strategies and providing necessary support infrastructure. Respondents also observed that in the Greater Mara, there was no priority in road repairs, signage, or ranger patrols for enforcement relative to the Mara Triangle. The Greater Mara was perceived to have better management structures, and visible results made it look like a different destination, yet, it is part of the larger MMNR ecosystem administratively.

These differing management styles and structures mean confusion in implementing strategies, including visitor codes, consequently meaning delivering different experiences together, with The Greater Mara exhibiting laxity on their part. As a conservation area and ecosystem, differences in management structures and strategies become counterproductive for sustainable conservation and visitor management (Bhandari, 2014; MMWCA, 2022; Onchwati et al., 2010). The entire MMNR should be under one management structure. Otherwise, having The Mara Triangle and The Greater Mara under different management structures will perpetually be a source of conflicting priorities, visitor experiences, and thus the destination's sustainability (Bushell & Bricker, 2017; Wolf et al., 2019). The County government

In addition to the above arguments, reserve rules and regulations enforcement came second (Table 4.10 above). Respondents raised sentiments about the vast area; therefore, there was no effective enforcement. Where it existed, the respondents noted favouritism, bribe-taking, corruption, or no strictness or fines by the rangers. In this regard, NI or visitor codes and enforcement did not manage to control the negative behaviour of wildlife viewers. These were observable cases of wildlife viewers driving too close to wildlife, harassing wildlife, and not respecting others, especially at sightings. These are common occurrences at tourism destinations without strict enforcement (Freeman et al., 2021; Sindiyo & Pertet, 1984; Verbos et al., 2018). Other impacts included littering, off-road driving, overcrowding, excessive vehicle track marks due to off-roading, encroaching crossing points, trampling, and degrading vegetation. These findings implied that for NI techniques as soft strategies to succeed, diligent enforcement should complement them (Marschall et al., 2017; Poudel & Nyaupane, 2017) to ensure compliance. This scenario was especially true in the long run and especially in the high tourist seasons and attraction locations

that allow disembarkation or quickly generate excitement amongst the wildlife viewers, thereby throwing caution to the wind.

Tour guiding was third in ranking weak points of NI in MMNR. Some observable behaviour and attributes included unprofessional tour guides driving too close to wildlife. Some had foreign language deficiencies, and some flouted rules with impunity. Some were inexperienced, unlicensed, or had frosty relations with wildlife rangers, local guides, and visiting driver guides. Despite tour guiding being ranked the best NI strategy in MMNR, it has shortcomings and needs improvement. Because of this scenario, scholars opine that awareness creation and retraining of driver guides, especially local community guides, could remedy the situation (Kabii et al., 2017; Nguya et al., 2021; Weiler & Walker, 2014). The professional training and licencing of tour guides and membership in professional associations for regulation ensure long-term success and expertise in the sector.

The respondents also noted poor and inadequate signage and lack of information centres as the other weak aspect of NI in MMNR. A well-laid information centre was seriously lacking, especially at the gate areas. Despite information being essential for visitors, responses indicated that they were either few, lacking, or unavailable in multiple languages. The lack or inadequacy of the signage and information centres could have hindered information sharing and awareness creation that could facilitate understanding, public relations, and possibly responsible behaviour as supported by earlier research like Marschall et al., (2017), Mifsud (2017), Poudel and Nyaupane (2017), and Powell & Ham, 2008). The lack of physical structures to house visitor information centres at entry points was an issue to be addressed urgently at all the gates and strategically staffed locations. Svobodova et al., (2019) observed that trail characteristics could affect choice and visitor numbers to a nature trail destination.

Another weak aspect of NI in MMNR was the lack of support amenities to accommodate the wildlife viewing activities. The most notable responses were the lack of public washrooms at the wildlife crossing Lookout, the balloon landing area, and the road stretching from Keekerok lodge to Mara River bridge. The *migration crossing Lookout* specifically stood out for lacking pest-proof litter bins as a basic amenity in addition to all-weather picnic tables, chairs, and other designated areas. The non-existence of these amenities resulted in littering and related wildlife menace evinced in other nature-based destinations (Grünewald et al., 2016). Indeed, these amenities enrich the visitor's comfort and experience; thus, maintaining existing amenities and developing new ones is necessary for wildlife viewers (Mutanga et al., 2017; Oviedo-García et al., 2019).

Last but not least was the existence of bad roads and trails that were not maintained regularly. Bad roads hinder access and comfortable viewing of wildlife all year round (Grace et al., 2017; Grünewald et al., 2016). The Greater Mara was most affected in the rainy season because of poor and impassable all-weather roads and nature trails. Some areas, like *'the balloon landing area'*, had impassable ravines and lugers when it rains. The major roads in The Greater Mara also lacked proper signage indicating junction numbers, directions, distances between points, or feeder tracks. Some road junctions were *overcrowded* with signage, especially at *Kilosaba* and Junction to *Talek* gate along Route 24 from *Sekenani* gate. Indeed, there was a distinct contrast in infrastructure development between the Mara Triangle and the Greater Mara. Poor road infrastructure limits access to most reserve areas and means uncomfortable wildlife-viewing experiences (Maslovskaja et al., 2020). Some best practices and properly done directional signage and road junction numbering has been done at the Nairobi national park, Lake Nakuru national park, Tsavo East and Tsavo West national parks among other wildlife conservation areas in Kenya..

In the spirit of NI, this uncomfortable ride due to poor road conditions, tour guides commonly positively repackage it as a 'free African massage experience' (Kabii, Wandaka, Wamathai, et al., 2019; Sindiyo and Pertet, 1984). Such a retort is geared towards spicing up an otherwise uncomfortable experience. Despite the humour, time wastage, a broken-down vehicle, or being stuck in the mud are other possible inconveniences. The main tracks and trails certainly require regular maintenance. Otherwise, these are experiences best left for the adventure tourists seeking the off-the-beaten-track (Svobodova et al., 2019; Zhai & Baran, 2019), not the mass travel market that frequents MMNR. These poor road and trail conditions can erode the sheen of an otherwise world-class tourist destination, thereby robbing its visitation traffic and potential revenues.

4.2.4 NI Impact on Wildlife Viewers' Spatial Behaviour Patterns

To establish the behaviour patterns of wildlife viewers, the research carried out a participant field observation exercise by trailing wildlife viewers and their vehicles. Field observations on wildlife viewers' behaviour in 388 tour vehicles were made for six months, as detailed in Table 4.7 above. This was in November and December 2020, January, February, August, September, and October 2021. Study results indicated that most of the observations were made in the high season month of August 2021 (31.4%), followed by the shoulder season months of December (22.9%) and November (20.6%). On the other hand, January and February 2021 had 10.8% and 1.9%, respectively, and September 2021 had 2.3% of the total observations (n=388). These results were anticipated and depicted the general cyclic visitation patterns and tourist seasons in MMNR.

Study results indicated that smaller wildlife was the least viewed, which goes against the fact that small wildlife and wildlife were the most abundant in MMNR. This finding gave the impression that small wildlife was of the most negligible value and viewed while the vehicles moved. According to Bhandari (2014) and Green et al., (2019), large wildlife and big cats are highly sought after because they are rare outside most protected areas and generally considered dangerous. In this regard, therefore, they awed and excited wildlife viewers. Freeman et al., (2021) observe that it is common for visitors to prefer and value some wildlife and not others. Indeed, the big cats were a major attraction, probably from their thrilling hunts, killings, feeding, and rests near their kill (Bhandari, 2014; MMWCA, 2022). In addition, cats tended to be more inactive and rarely actively moved around during the day's heat (Ghosh et al., 2019). This inactivity and resting in the same spot for long hours of the day made them readily accessible by many wildlife viewers and vehicles in droves. The situation differed for large herbivores or small wildlife species shying away from vehicles. They were always mobile as they grazed in the rolling savanna, alert or evading possible predation threats.

Despite a visitor code to keep a distance of more than 25 metres from wildlife, it was clear that over 46.7% of the wildlife viewers in MMNR drove closer than expected. Indeed, the researcher observed that as wildlife viewers got overly excited, desiring to get a better experience, tour guides carelessly drove tour vehicles too close or surrounded wildlife by several vehicles, making them distressed. Behaviour that hinged on animal harassment and was potentially dangerous to wildlife viewers, especially those in open safari jeeps (Bhandari, 2014; Freeman et al., 2021; Kubo et al., 2019; Navrud & Mungatana, 2018). It has been a common challenge, especially for the big cats and in the high season months in savannah parks and reserves (CGN, 2020; Green et al., 2019; the Republic of Kenya, 2013). In such a scenario, ranger patrols and strict enforcement with punitive measures will suffice in the short term, especially during the high tourism months and morning hours when this menace is rife (Bhandari, 2014; Juma et al., 2020). However, in the long term, tour guide retraining and awareness creation can be critical strategies (Verbos et al., 2018).

Study results revealed that 29.9% of the wildlife viewing vehicles stopped for five minutes or less at a sighting. A majority (45.4%) spent an average of 10.5 minutes (6 - 15 minutes), an acceptable duration. About three-quarters (75.3%) of the tour vehicles spend less than 15 minutes at wildlife sightings. Any extended stay is animal harassment and can lead to habituation in the long run (Navrud & Mungatana, 2018; Verbos et al., 2018). About 25% of the tour vehicles spent longer than 16 minutes and thus fell in that category. A finding supported by earlier research in similar wildlife-protected areas indicated that extended stays at sightings led to habituation (Freeman et

al., 2021; Weber et al., 2020). It was noted especially for cheetahs that sought vehicle rooftops as vantage points for area scanning for a potential hunt or seeking shelter under the car shed in the afternoon heat.

Study results showed that overspeeding and littering at wildlife sightings were not a big concern in MMNR. In the case of no overspeeding, this could be credited to the poorly maintained all-weather roads and trails that did not allow speeds higher than 50 kph. At sightings, wildlife viewers were busy with photography or observing the wildlife attractions, unlike at picnic sites like the migration crossing ‘*Lookout*,’ where alighting from vehicles was permitted for relaxation or snacking in an area lacking basic amenities like toilets or dustbins, quickly got littered. Scholars opine that basic infrastructure at designated visitor areas for picnics, wildlife viewing platforms, or camping requires basic amenities like water, cloakrooms, litter bins, sitting areas, and surfaces essential for visitor comfort and mitigating possible negative impacts (Grünewald et al., 2016; Maslovskaja et al., 2020; Vengesayi et al., 2009). These amenities should be durable, weatherproof, and designed sensibly to blend with the natural environment.

Except for restricted access areas, study results indicated (Figure 5:13) that high numbers of tourists visit the entire MMNR, thus portending the danger of negative impacts. This scenario compels strict destination area planning, development and the enforcement of tourist use zones. The Upper Mara Triangle Governors Camp, Mara Intrepid Explorer Rekeru, Central Mara Triangle -Serena Area, the Lower Mara Triangle Tanzania Border, Keekerok lodge to Sand River area, and Mara Simba to Talek regions can be categorised as medium-use zones. On the other hand, the Meta plains, Mara Bridge and Border Viewpoint, and Keekerok Airstrip -Mara Hippo -Sarova Regions are high tourist use zones. In this regard, nature interpretation and enforcement initiatives should mirror these wildlife viewers, dispersal patterns within the MMNR.

4.2.4.1 Correlation Analysis of Observed Behaviour Patterns

The *month of observation* implied that the touristic season did not correlate with tour guides respecting *other reserve users*, *wildlife viewers littering*, and *drivers observing the speed limits* (Table 4.8 above). These variables yielded p-values higher than the acceptable error margin of 0.05. This result depicted that the month of visitation did not affect the behaviour of tour guides respecting other reserve users, littering, and observing the speed limits. As supported by some researchers, this finding emphasizes that any measures to mitigate these behaviours should not depend on the touristic season (Geng et al., 2021; Norkaew et al., 2019; Švajda et al., 2018). This finding goes against the notion that more initiative and effort are required in the high season than

in the low season. Nevertheless, current study findings emphasize the need for a long-term approach to managing littering, overspending, and ensuring safety for reserve users.

On the other hand, the tourist season had a very weak negative correlation with the number of tourists in the group, duration at a sighting, off-road driving in restricted areas, and lastly, harassing wild animals. These results revealed that as the year advanced in months and thus tourist seasons, the number of tourists in a wildlife viewing group, duration at a sighting, off-road driving, and harassment of wild animals reduced marginally. This finding was a unique observation, implying that bigger group sizes travel during the low season or early months of the year, with smaller group sizes travelling later. The other reason for these findings is that the great wildebeest migration dictates the high tourist season and thus attracts persons with prior knowledge and interest in MMNR. These tend to act more responsibly, drawn into the MMNR by pull factors, not push considerations (Fishbein & Ajzen, 2010; Poudel & Nyaupane, 2017).

Secondly, albeit the inverse effect is marginal, as the months of the year advanced, the duration of a wildlife sighting reduced in the high season compared to the low season. This finding could be attributed to wildlife abundance in the high season; thus, more sightings of any wildlife species are assured, and less time will be spent at a sighting compared to the low season. Relative to the low season, study results indicated a decline in cases of off-road driving in restricted areas and reduced instances of wildlife harassment in the high season months. An observation that could be attributed to stricter enforcement and patrols in the high season months and the abundance of wildlife everywhere, making sightings easier (Bhandari, 2014; Juma & Khademi-Vidra, 2022; MMWCA, 2022). Only hooting/ making noise had a very weak positive correlation with the month of observation. These study results implied more hooting in the high season than in the low season. This finding could have emanated from vehicle congestion at sightings with less order, making tour drivers impatient. However, the relationship between the month of observation and wildlife viewers making noise was marginal.

Further to these findings, the observation month had a weak positive correlation with observation time, wildlife category, and estimated distance from wildlife. This weak positive correlation depicted a weak direct relationship with these variables. As the number of visitors increased by season, the time visitors went for wildlife viewing changed to later hours of the day. Wildlife sought to include big cats and even small game, and the estimated distance from wildlife sightings also increased. The behaviour pattern displayed by wildlife viewers for the month of

visit/observation varied by the time wildlife viewers set out for game viewing, the type of wildlife sought, and the estimated distance from nature at a sighting.

Two other variables had weak negative correlations with the month of visitation: the number of vehicles and overcrowding at a sighting. This result indicated an inverse correlation between the month of visit and the number of vehicles and cover crowding at a sighting. It is worth noting that overcrowding is a function of the number of vehicles at a sighting, where six vehicles or more are considered overcrowding. This result that showed a weak negative correlation depicted that overcrowding marginally changed inversely with changes in the touristic season or month of visitation. The relationships between the month of visit and behaviour attributes yielded mixed marginal results meaning that hard and soft VMS should be implemented with minimal variance from season to season.

The research also determined how the time wildlife viewers at a sighting correlated with other observable attributes. Study results revealed that observation time did not correlate with three variables: driver respects other reserve users, wildlife viewers litter, and hooting/ making noise. These findings imply that the time of the day wildlife viewing is done does not affect their behaviour pattern to respect others, litter, or hooting/noise by wildlife viewers in MMNR. On the other hand, the timing wildlife viewers were at a sighting had very weak negative correlations with the number of tourists in the group, overcrowding at a sighting, and harassment. These results showed that as the day changed from morning to evening, the number of tourists in the group, overcrowding at a sighting, and harassing wild animals reduced and vice versa. These results imply that for any stringent strategies like ranger patrols, fines, and other regulatory mechanisms, a slight emphasis should be in the morning and fewer interventions in the evening. Indeed, most wildlife viewers set out in the early morning hours as wildlife are also overly active in the early morning cooler temperatures (Grünewald et al., 2016; Kubo et al., 2019).

Further to these findings, one very weak positive correlation existed between observation time and the wildlife category. The result implied that more large herbivores and small animals than big cats were sighted as the day progressed from morning to evening. Indeed, as the day advanced and temperatures rose, big cats became docile and could seek cover in the shade, making them less visible (Freeman et al., 2021; Ghosh et al., 2019).

Study results also established a marginally indirect relationship between observation time and the number of vehicles at a sighting, off-road driving in restricted areas, and duration at a sighting. As

the day progressed from 6:00 AM to 6:00 PM, cases of off-road driving, the number of vehicles, and the duration that wildlife viewers spent at a sighting reduced marginally. These results implied that early morning wildlife viewing had a higher number of vehicles at a sighting, more cases of off-road driving in restricted areas, and a longer duration at a sighting. As the day progressed, all these behaviour attributes reduced marginally. This finding could be attributed to the notion that wildlife viewers had ample time to view wildlife in the early morning cooler temperature hours when wild animals were also active and more exciting than the rest of the day (Ghosh et al., 2019; Mitchell & Ryland, 2020; Verbos et al., 2018). In this regard, the need for more enforcement in the morning than later in the day as many cases of animal harassment, driving too close to wildlife, overcrowding, off-road driving, or extended stay at a wildlife sighting occur in the morning hours.

Another explicit finding was that as the number of vehicles at a sighting increased, the number of tourists and overcrowding increased. This finding was expected as MMNR is a wilderness reserve and tourists generally move around the reserve in tour vehicles except at designated areas because MMNR has dangerous wildlife that does not allow walking around on foot (Juma & Khademi-Vidra, 2022; MMWCA, 2022). Similarly, findings revealed that the duration of a sighting and animal harassment increased as tourist numbers increased. This result implies that many tourists at a wildlife sighting meant disorder, and therefore more time spent by wildlife viewers to get a better view, especially for photography (Matolo & Salia, 2017). The longer period spent meant more overcrowding and harassment of wildlife.

Further, these study results revealed that the most probable animal at the sighting could be a big cat as the number of tourists increased. In contrast, as the visitor numbers decreased, it meant small game and large herbivores, which were less sought after by tourists (from Table 4.8, where; {1} represented big cats, {2} large wildlife, and {3} small wildlife). This finding explicitly revealed the common scenario in wildlife tourism destinations where wildlife viewers generally preferred big cats to other wildlife (Maciejewski & Kerley, 2014; Moyle et al., 2017; Verbos et al., 2018).

Furthermore, there was a weak inverse relationship between the number of tourists at a sighting and estimated distance from wildlife, driver respect for other reserve users, and hooting/ making noise. As the number of tourists at a sighting increased, the estimated distance from wildlife reduced; similarly, cases of drivers respecting other reserve users and hooting and making noise reduced. Indeed, overcrowding is directly related to the number of vehicles at a sighting (Freeman et al., 2021; Maciejewski & Kerley, 2014; Moyle et al., 2017).

In addition, for the current study, as the number of vehicles at a sighting increased, the duration of wildlife viewers at a sighting and harassment of wildlife also increased moderately. Besides these, an inverse relationship was yielded. As the number of vehicles at a sighting increased, driver guides did not respect other reserve users but instead blocked each other's better views and paths or overstayed at a sighting. Consequently, they were compelled to drive closer for a better viewing position, eventually reducing the estimated distance from wildlife. This finding is common in wildlife-based tourism destinations with weak wilderness code of conduct enforcement (Allbrook & Quinn, 2020; Green et al., 2019; Matolo & Salia, 2017; Poudel & Nyaupane, 2017).

On the other hand, as the number of vehicles in a sighting increased, a marginal increase in cases of off-road driving and making noise/hooting amongst the tour vehicles and tourists was experienced. Last but not least, wildlife viewers littered did not correlate with the number of vehicles at a sighting. Wildlife viewers overcrowded at a sighting had one strong positive correlation with harassing wild animals. This result emphasized that increasing vehicles and wildlife viewers at a wildlife sighting automatically increased animal harassment (Ogutu et al., 2014; Petracca et al., 2021; Sindiyo & Pertet, 1984). Another moderate positive correlation was yielded with duration at a sighting. This direct relationship depicted that increased overcrowding led to a moderate increase in vehicle and wildlife viewers' duration at a sighting.

On the contrary, overcrowding at a sighting negatively correlated with the wildlife category. This result indicated that as overcrowding increased, the wildlife category decreased, that is, from small wildlife (3) to large wildlife (2) and big cats (1), as detailed in Table 4.8 above. It can be argued that overcrowding is more loosely associated with big cat sightings than large or small wildlife (Ghosh et al., 2019; Petracca et al., 2021). Further to these findings, overcrowding at a sighting had two weak negative correlations: estimated distance from wildlife and driver respect for other reserve users. This inverse relationship indicated that as overcrowding at a sighting increased, the estimated distance from wildlife reduced.

In addition, overcrowding at a sighting had weak positive correlations with off-road driving in restricted areas and hooting/ making noise. These results revealed a weak direct relationship between overcrowding at a sighting on one hand and off-road driving in restricted areas and hooting/ making noise on the other. As overcrowding at a sighting increased, off-road driving and making noise amongst wildlife viewers also marginally increased. Last but not least, *overcrowding at a sighting* did not correlate with wildlife viewers littered and observed speed limit. Thus,

overcrowding at a sighting did not have any relationship with wildlife viewers littering and observing speed limits.

Study findings on how the wildlife category correlated with other observational attributes yielded moderate, weak, very weak to no correlations. The wildlife category had a moderate positive correlation with the estimated distance from wildlife. This relationship depicted that the wildlife category affected the distance the wildlife viewers stopped from a sighting. That is, big cats (1) were viewed at short distances, while large herbivores (2) and small wildlife (3) were viewed from far and much further away, respectively (see Table 4.8 above). Duration at a sighting and harassing wild animals had moderate negative correlations with the wildlife category. The result meant that the wildlife category had an inverse relationship with the duration taken at a sighting and wildlife harassment. That is, big cats (1) were viewed for a longer duration and harassed more compared to large wildlife (2) and small wildlife (3). This finding could be attributed to the fact that big cats were docile and rested for long periods of the day (Petracca et al., 2021) than herbivores and other wildlife, which mainly were very mobile, while others were shy.

The wildlife category registered one weak negative correlation with off-road driving in restricted areas. This result indicated that big cats were a marginal reason for off-road driving. The results imply that the wildlife category changed from big cats (1) to large wildlife (2) and small wildlife (3), the fewer and fewer cases of off-road driving in restricted areas occurred. A very weak positive correlation was observed with drivers respecting other reserve users. The wildlife category had a negligible relationship with drivers' respect for other reserve users. Another very weak but negative correlation was noted with hooting or making noise. The result implied that big cats generated more excitement than large mammals and small wildlife, observed with less or no noise. The study results revealed that the wildlife category had no relationship with *wildlife viewers littered* and *kept the speed limit*.

Estimated distance from the wildlife negatively correlated with harassing wild animals. This result implied that as the estimated distance from wildlife increased, animal harassment reduced and vice versa. Indeed, this is true as wildlife will only feel harassed when the tour vehicles and wildlife viewers move too close to wildlife (Borges & Ronda, 2017; Matolo & Salia, 2017). The *estimated distance from wildlife* generated weak negative correlations with *duration* at a sighting and off-road driving in restricted areas. This inverse relationship implied that as the estimated distance from wildlife increased, the time wildlife viewers spent at a sighting reduced marginally.

Similarly, the cases of off-road driving reduced. Further to these findings, one very weak positive correlation was established with '*tour drivers respect other reserve users*'. This result loosely implied that as the estimated distance between wildlife viewers and wildlife at a sighting increased, cases of tour drivers respecting other reserve users also increased, albeit marginally. This scenario could be attributed to the fact that the further away a sighting is, the less they scramble and block each other to get a better view of the wild animal. On the other hand, the estimated distance from wildlife had very weak negative correlations with participants' in wildlife viewing littered and hooting/ making noise. These results meant that the estimated distance from wildlife increased, and cases of wildlife participants littering and making noise reduced. There was not much excitement while far from wildlife that would make noise (McIntosh & Wright, 2017; Sindiyo & Pertet, 1984). Similarly, as noted earlier, wildlife viewers tended to spend more time at a sighting when closer to wildlife (Petra et al., 2021), and as such, the tendency to snack or drop litter was higher. These results notwithstanding, estimated distance from wildlife at a sighting did not show any relationship with observance of speed limits.

Duration at a sighting had one moderate positive correlation with harassing wild animals. The result indicated that as the duration of a wildlife sighting increases, harassment of wildlife increased moderately. On the other hand, the period of wildlife viewers at a sighting had a moderate positive correlation with off-road driving in restricted areas and hooting/ making. The result depicted a weak relationship; whereas duration at sighting increases, off-road driving cases in restricted areas increased marginally and vice versa. Similarly, there was a marginal increase in hooting and noise at the sighting. Duration at a sighting had two very weak correlations at a 95% confidence interval, one being positive and another negative; that is, tour driver-guides respected other reserve users, and wildlife viewers littered, respectively. The results implied that as the duration at a wildlife sighting increased, there was a marginal decrease in respect for other reserve users and, on the one hand, an increase in cases of wildlife viewers littering. Last, wildlife viewers' duration at a sighting did not correlate with observance of speed limits. The reason for this could be that at a wildlife sighting, vehicles were predominantly stationary with minimal movements to get a better angle of view if the wildlife were obscured by vegetation or other vehicles, and thus no need for speeding the vehicle.

Driver's respect for other reserve users had weak negative correlations with harassing wild animals and hooting/ making noise. This result depicted a weak inverse relationship between the drivers respecting other reserve users and harassing animals, and making noise at wildlife sightings. That is, an increase in drivers respecting other reserve users resulted in reduced harassment of wildlife

and making noise at sightings. Courtesy seemed to depict responsible behaviour amongst reserve users (Kuo, 2017; Poudel & Nyaupane, 2017). The behaviour attribute that the driver respected other reserve users did not correlate with off-road driving in restricted, wildlife viewers litter, and observed speed limit. This result implied that tour guides respecting other reserve users did not affect off-road driving, littering, and observance of the speed limits by wildlife viewers.

Table 4.15: Objective four: Spatial Behaviour Pattern Correlation Tests

No.	Observation attribute	Observation attribute	
		(correlated) Reject null hypothesis	(Did not correlate) Accept null hypothesis
A.	Observations month	B, C, D, E, F, G, H, J, L, M,	I, K, N
B.	Observation time	A, C, D, E, F, G, H, J, L, N	I, K, M
C.	Number of tourists in the group	A, B, E, F, G, H, I, J, L, M, N	K
D.	Number of vehicles at a sighting	A, B, C, E, F, G, H, I, J, L, M, N	K
E.	Overcrowding at a sighting	A, B, C, D, F, G, H, I, J, L, M	K, N
F.	Wildlife category	A, B, C, D, E, G, H, I, J, L, M	K, N
G.	Estimated distance from the wildlife	A, B, C, D, E, F, H, I, J, K, L, M	N
H.	Duration at a sighting	A, B, C, D, E, F, G, I, J, K, L, M	N
I.	Driver respects other reserve users	A, B, C, D, E, F, G, H, L, M	J, K, N
J.	Off-road driving in restricted areas	A, B, C, D, E, F, G, H, N	I, K, L, M
K.	Wildlife viewers litter	G, H	A, B, C, D, E, F, I, J, L, M, N
L.	Harass wild animals	A, B, C, D, E, F, G, H, I, J, M	K, N
M.	Hooting/ making noise	A, C, D, E, F, G, H, I, L, N	B, J, K
N.	Observes a speed limit 50kph	B, C, D, M	A, E, F, G, H, I, J, K, L

KEY: Observation checklist attribute: -

- A. Observations month
- B. Observation time
- C. Number of tourists in the group
- D. Number of vehicles at a sighting
- E. Overcrowding at a sighting
- F. Wildlife category
- G. Estimated distance from the wildlife

- H. Duration at a sighting
- I. Driver respects other reserve users
- J. Off-road driving in restricted areas
- K. Wildlife viewers litter
- L. Harass wild animals
- M. Hooting/ making noise
- N. Observes a speed limit of 50kph

(Research Data, 2022)

Off-road driving in restricted areas had a moderate positive correlation with the *harassment of wildlife*. As cases of off-road driving increased, the cases of wildlife harassment also increased moderately. Other observational attributes, such as *wildlife viewers littering, making noise, and observed speed limit*, did not correlate with *off-road driving to restricted areas*. These results showed that off-road driving did not affect littering, noise, or speed limit observance. *Wildlife*

viewers littered did not correlate with *harassing wild animals*, *hooting/ making noise*, and *observing the speed limit*. The result depicted that wildlife viewers litter did not have any relationship or effect on harassment of wild animals, hooting/ making noise, or observing speed limit add vice versa. '*Harassing wild animals*' had a weak positive correlation with *hooting/ making noise* and no correlation with '*observed speed limit*'. These results indicated that *harassing wild animals* had a weak direct relationship with hooting and noise. An increase in noise-making resulted in a marginal increase in the harassment of wildlife and vice versa. On the other hand, harassing wildlife has no relationship or effect on observing the speed limit.

Lastly, '*hooting/ making noise*' had a very weak correlation with *observing the speed limit*. The relationship depicted that speed limit observance increased marginally as hooting/ making noise increased. For the null hypothesis, '*there are no spatial behaviour patterns amongst wildlife viewers in MMNR*', posted mixed results (Table 4.15). However, it was evident that the observation month (A) did not correlate with '*driver respect for other reserve users*', '*wildlife viewers drive participants littered*' and '*observed a speed limit of 50kph*'; thus null hypothesis was not rejected for these three attributes. On the other hand, *observation time*, *number of tourists in the group*, *number of vehicles at a sighting*, *overcrowding at a sighting*, *wildlife category*, *estimated distance from the wildlife*, *duration at a sighting*, *off-road driving in restricted areas*, *harass wild animals* and *hooting/ making noise* correlated observation month, thus the null hypothesis rejected. '*Observation time*' (B) did not correlate with '*drivers respect other reserve users*', '*wildlife viewers littered*' and '*made noise*'; thus, the null hypothesis was not rejected.

Observations month, *number of tourists in the group*, *number of vehicles at a sighting*, *overcrowding at a sighting*, *wildlife category*, *estimated distance from the wildlife*, *duration at a sighting*, *off-road driving in restricted areas*, *harassing wild animals*, *hooting/ making noise*, and *observes speed the limit* correlated with *observation time* and thus the null hypothesis rejected. The *number of tourists* (C) and *vehicles* (D) at a wildlife sighting showed correlations with all the observational attributes; thus, the null hypothesis was rejected. The only exception was wildlife viewers litter, where the null hypothesis was not rejected. Overcrowding at a sighting (E), wildlife category (F), and harassing wild animals (L) had correlations with all the other attributes except for wildlife viewers littered and observed the speed limit. Thus, the null hypothesis was not rejected and rejected for the former and latter. Estimated distance from the wildlife (G) and duration at a sighting (H) correlated with all the other observable attributes except drivers observed the speed limit. Therefore, the null hypothesis was not rejected for '*observed the speed limit*' and rejected for all the other attributes. *Tour driver respects other reserve users* (I) correlated with all

other attributes except for *off-road driving in restricted areas*, *wildlife viewers litter*, and *observing the speed limit*. In this regard, the null hypothesis for correlated attributes was rejected but not rejected where no correlation was established.

The null hypothesis for *off-road driving in restricted areas* (J) was rejected for all other attributes except *drivers respect other reserve users*, *wildlife viewers littered*, *harassed wild animals*, and *made noise*, where the null hypothesis was not rejected. *Wildlife viewers litter* (K) had the null hypothesis rejected for estimated distance from the wildlife and duration at a sighting. On the contrary, for other observational results, the null hypothesis was not rejected when correlated with wildlife viewers littering. There being no correlations, hooting/ making noise (M) had the null hypothesis not rejected for observation time, off-road driving in restricted areas, and wildlife viewers litter. The null hypothesis was rejected for the observation month, number of tourists and vehicles at a sighting. The same applies to overcrowding at a sighting, the wildlife category, estimated distance from the wildlife, duration at a sighting, tour drivers respect other reserve users, harass wild animals, hooting/ making noise, and observing the speed limit. Tour guides observe speed limit (N) correlated with observation time, making noise, and the number of tourists and vehicles at a sighting; thus, the alternate hypothesis was adopted. The null hypothesis was not rejected for the other observable behaviour attributes correlated with the observed speed limit.

CHAPTER 6: CONCLUSIONS, RECOMMENDATIONS AND NEW SCIENTIFIC FINDINGS

5.1 Conclusions

5.1.1 Effects of Demographic Characteristics on Behaviour

NI was established to affect tourist behaviour in MMNR positively. Respondents learned about nature and fauna through various interpretive methods; NI information was observed as key behaviour change as an informed mindset acts responsibly. According to the study, wildlife viewers had a favourable experience, supported nature explanation efforts, did not damage attractions, and supported conservation areas. Interpretations of nature and wildlife helped wildlife viewers observe visitor guidelines and orientation signage, while inferential statistics showed that NI did not increase conservation funding.

According to the study, all NI techniques can be implemented all year round. The month of visit, nationality, gender, age, education level, and vehicle type hardly affected the effectiveness of NI. On the other hand, the purpose of the visit affected NI's ability to make visitors act ethically and not harm attractions. It suggested awareness and connection to the location and its qualities, demanding appropriate behaviour. In addition, the study revealed weak inverse relationships between wildlife viewers' support for NI and the month of visit. NI garnered less support as the year progressed from low season to high season and vice versa.

Further to these findings, their support for NI decreased as respondents aged. Young individuals favoured NI and were more conscious of conservation issues. On the other hand, visitors on self-drive supported NI more than driver guides. These findings contradict previous studies that showed knowledgeable tour operators were more responsible than unskilled ones. These data revealed a slight connection between nationality, visit purpose, and NI. In addition, contrary to popular opinion, gender and education did not affect NI support. The negative and weak correlations suggested a weak indirect association between conservation area funding and nationality or visit purpose. This conclusion largely supported past studies on conservation funding. Visit month, gender, age, education level, and vehicle type did not correlate with wildlife viewers did not support conservation areas financially after NI.

5.1.2 Effect of Tour Guiding Delivery on Wildlife Viewer's Behaviour

Study responses endorsed tour guides for excellent wildlife knowledge, good tour-leading skills, insightful NI, and visitor dos and do nots. Despite the 15.1% to 27.4% ambivalence rate, the

affirmations therein primarily supported MMNR tour guides' competence in executing their duties. These results aligned with past studies and emphasised tour guiding's role in visitor management. "Tour guides need regular interpretational training and sensitisation" received the most ambivalence (27.4 per cent). Despite respondents being ignorant of tour guides' training backgrounds, there was a unanimous assertion that tour guides required regular interpretation training and sensitisation to competently and consistently positively influence wildlife viewers' behaviour.

Wildlife viewers showed weak positive correlations with all tour guide delivery aspects except visitor codes, which correlated moderately. Wildlife viewers were made knowledgeable, obeyed visitor guidelines and signage supported NI, and had a positive experience after interacting with tour guides. Tour guides knew wildlife, had good guiding abilities, gave insightful nature commentary, and explained tourist codes. All attributes demonstrated a minor positive association with tour guides needing interpretation training and sensitisation, except wildlife viewers supporting NI. Tour guiding showed a weak association with wildlife viewers' behaviour in MMNR. Elements other than tour guide delivery may have contributed to wildlife viewers' behaviour, such as visitor codes, maps, orientation signage, or visitor information centres. The proposal for tour guides' refresher training and sensitisation marginally influenced wildlife viewers' behaviour.

About 45.8% of respondents advocated a new tour guide training programme in MMNR. 32,1% were undecided, and 22,1% were opposed. The high ambivalence could be because many were unaware of what it means to be a tour guide, the tour guide's training background, or they could not evaluate the tour guide's delivery through the brief interaction. Qualitative analysis revealed six important thematic areas to be included in a new MMNR tour guide curriculum and were ranked by their weighted frequencies. These were codes of conduct and laws regulated tour guiding, customer care and public relations, identification, natural history, animal distribution, wilderness navigations, safety, and survival tactics. Other topics included wildlife behaviour, interactions, conservation, and protected area administration.

Most respondents (28.97%) put the professional code of conduct first, which indicated that successful visitor management depended on tour guides and visitors understanding the wilderness code of ethics and conduct. Furthermore, despite the tour guides being viewed as competent, qualitative results showed room for improvement and thus required professional training and thus fulfilling one of Kenya's tour guide regulatory provisions. Customer care and PR were ranked

second (19.24%), with responses implying that general NI was an essential service and function that assured guest comfort, satisfaction, great word of mouth, and repeat business. Indeed, good customer service and NI help tourists enjoy themselves, have memorable experiences, and act more responsibly because they know their responsibilities.

NI includes identification, behaviour, distribution, and other information regarding diverse biodiversity to explain why, when, or how things are. Interpreters should know MMNR's wildlife because large wildlife, big cats, or even the big five are attractions that enrich visitor experiences, as do information in print, books, signage, electronic media, or presented by tour guides during NI. Wilderness navigation, safety, and survival tactics were other themes identified. Nature interpreters and facilitators should navigate the reserve easily for a safe, efficient, and enriching visitor experience. Tour guides spend the most time with tourists and are vital in visitor management. Tour guides are destination ambassadors mediating physical access, encounters or interactions, intellectual access, and empathy/inspiration. Tour guides must therefore know their position in park or destination administration for effective and responsible representation.

The study rejected the null hypothesis that tour guiding does not modify wildlife viewers' behaviour. Results revealed that wildlife viewers were knowledgeable, acted ethically by avoiding affecting attractions, respected visitor rules and navigational information, and supported conservation areas financially after interacting with tour guiding services. Nevertheless, these behaviours had weak to frail relationships with tour guide training attributes, adopting the alternative hypothesis. Wildlife viewers supporting NI initiatives did not correspond with tour guides requiring regular interpretation training and sensitisation. Wildlife viewers supported NI efforts correlated with tour guide training and competency, and tour guides communicated do's and do not's. Tour guides had good wildlife knowledge, outstanding guiding skills, insightful NI and explained codes and signage. These notwithstanding, the researcher is of the view that tour guides require an attitude change through awareness creation and strict enforcement and punitive measures for defaulters.

5.1.3 Effect of Non-Personal NI on the Behaviour Exhibited

The study sought to establish how non-personal forms of NI affect the behaviour exhibited by wildlife viewers at MMNR. Display boards were more noticeable than visitor codes or visitor centres. Despite these critical insights that regulatory communication and information were crucial for visitor management, guest information points or centres were either absent or inadequate in

most key locations. In this regard, non-personal NI was less conspicuous, and its impact was low and thus should be improved.

Study findings revealed that existing visitor codes, display boards, and directional signage earned the highest positive reviews. Visitor codes, display boards, and orientation signage ranked second. Visitor codes, exhibit boards, and directional signage were the *'right size and visible'*. Visitor codes, exhibit boards, and navigational signage *'were strategically placed'* yielded mixed results, while largely dissenting views were on *'are too many.'* Wildlife observers did not follow the rules and orientation information due to tourist pressure for better wildlife views and photography (77.2%) and the desire of tour guides to deliver a pleasant experience (71.8%), and ignorance of visitor code (46.5%). These results highlighted the need for vigorous patrols, guest code enforcement, and tour guide training and seminars. The study proposes stricter enforcement to restore sanity.

Field observation behaviour attributes had weak and moderate correlations. The study found few links between wildlife viewers' *'knowledge of nature and wildlife'* and *'financially supporting conservation areas'* and non-personal NI. Wildlife viewers' behaviour correlated with non-personal NI. Thus, the alternate hypothesis was adopted for visitor codes, display boards, and orientation signage were *'too many, "strategic," "visible,"* and *'communicated by tour guides.'* These results illustrated the importance of non-personal NI in promoting responsible visitor behaviour.

The behaviour attribute that *'NI made wildlife viewers act responsibly and not impact attractions'* correlated with the questionnaire item that non-personal forms of NI are *strategically located, of appropriate size, easy to read and understand, and communicated to tourists by tour guides.* Thus, the alternative hypothesis was adopted. *NI that made wildlife viewers act responsibly and not impact attractions* did not correlate with visitor codes, and orientation signs *'were too many'*; thus, the null hypothesis was not rejected.

Results were the same for wildlife tourists' *observe rules and signage'*, *'support NI efforts'* and *'have a satisfying experience'*. These behaviour qualities were associated with the question non-personal NI *'was adequate', 'strategically positioned', 'appropriate size', 'easy to read and understand',* and *'were communicated to tourists by tour guides'*. *Wildlife viewers' support for NI efforts* did not correlate with the *availability of non-personal NI*; thus, the null hypothesis was not rejected. The null hypothesis was rejected for the other four non-personal NI attributes with weak

and negligible positive associations. These were '*strategically positioned*', '*visible*', '*easy to understand*', and '*communicated by tour guides to tourists*'. '*Acting responsibly not to impact attractions*', '*supporting wildlife interpretation*', '*satisfying experience*', and '*following visitor codes and directional signage*' did not correlate with '*visitor codes*', '*display boards*', and '*directional signs*'. Study results further revealed that non-personal interpretation works regardless of quantity, so they should be positioned strategically, clearly, and easily read.

The study used open-ended questionnaire items to assess NI in MMNR, and nine (9) strong points were identified. These included wildlife, park conservation and management, tour guidance, a satisfying experience, the big five, wildebeest migration, visitor codes, directional signage, and roads and trails. Seven (7) NI weaknesses in MMNR were found; tour guiding, insufficient law enforcement, limited/poor signage, and the absence of an information centre were closely related to NI. 42.71% of park management and conservation lack amenities and poor roads and trails. NI problems and poor management and conservation at MMNR caused 10.99% of the total. In essence, tour guiding and visitor codes should not be left to self-regulate but complemented by diligent enforcement and punitive measures against errant tour guides and visitors. The researcher observed that there was laxity, especially at the Greater Mara and haphazard implementation characterized by favouritism and bribe-taking by the rangers. The rangers should be properly remunerated and motivated to enforce compliance effectively, as happens in the Mara Triangle.

5.1.3 NI Impact on Wildlife Viewers' Spatial Behaviour Patterns

From field observations, although small and large wildlife were abundant in MMNR, they were less viewed than large cats, making them seem less valuable or viewed while vehicles moved. On the other hand, big cats were a significant attraction owing to their spectacular hunts, killings, feeding, and resting around their killing. Resting in the same spot for an extended period of the day made them easily accessible to many wildlife viewers and vehicles through referrals.

Despite visitor guidelines stipulating a 25-meter distance from animals, 46.7% of MMNR wildlife viewers drove too close. Tour guides drove too close to animals or surrounded them with many vehicles, disturbing big cats, while wildlife lovers sought a better experience. 75.3% of tour vehicles spend less than 15 minutes at animal sightings, which was fine. Any lengthy stay can lead to animal habituation and harassment. These notwithstanding, 25% of tour vehicles stayed beyond 16 minutes. Speeding vehicles and littering at wildlife observations were not a problem for MMNR, except at picnic areas like the *Look-out* for the migration crossing, where alighting from a vehicle was permitted, as areas lacked bathrooms or dustbins.

Correlational test results revealed that the month of visiting did not alter tour guides' respect for other reserve users, littering, or speeding. The study found that mitigating these behaviours should not depend on the tourist season. In addition, as the year progressed, the number of tourists in wildlife viewing groups, length at a sighting, off-road driving, and harassment of wild animals decreased. The great wildebeest migration and associated wildlife fuels this development and draws many visitors to the MMNR as the pull factors.

Visitors' duration at a sighting dropped as the year advanced into the high season, when a shorter duration was experienced relative to the low season. Time of wildlife viewing, wildlife category, and distance from wildlife had a weak positive relationship with the month of visit. Seasonal increases in visitation led to later animal viewing hours. The time wildlife viewers headed out for game viewing, the type of wildlife sought, and the projected distance from nature at a sighting all influenced their monthly behaviour patterns. As the day progressed, group size, congestion, and animal harassment reduced, and vice versa. As the day progressed, off-road driving, the number of vehicles, and the duration of sightings dropped. The longer a sighting lasted, the more likely congestion and wildlife disturbance would occur. In addition, because big cats attract more vehicles and guests, these species were often overcrowded and harassed. In addition, as the number of tourists or vehicles at a wildlife sighting increased, the distance between vehicles and the big cats sighting decreased. Overcrowding was linked to big cats, not large or small wildlife. Overcrowding at wildlife sightings increased/ encouraged off-road driving and noisemaking, not respecting other vehicles, ecological harm, wildlife harassment, and disorderly conduct.

The observation month did not correlate with driver guides respecting other reserve users, littering, or speeding. The null hypothesis was not rejected. The rest of the behaviour attributes correlated with the observation month, and these were observation time, number of tourists, number of vehicles at a sighting, overcrowding, wildlife type, estimated distance from the wildlife, sighting duration, off-road driving in restricted areas, harassing wild animals, and hooting/making noise. Wildlife observers littered and made noise, supporting the null hypothesis. The number of tourists and vehicles at a wildlife sighting, overcrowding, wildlife category, duration and distance, off-road driving, harassing wild animals, generating noise, and breaking speed limits were linked with observation time, so the null hypothesis was rejected.

The number of tourists and vehicles at a wildlife sighting correlated with all observable factors; hence the null hypothesis was rejected. Except for littering and speeding, all other traits were related to overcrowding, wildlife, or harassing wild animals. So, the null hypothesis was not

rejected, and the alternative hypothesis was rejected except for speed, estimated distance from animals, and sighting time-correlated with all observable features. In all cases except speeding, the null hypothesis was rejected. Respect for other reserve users is universal except for off-roading, littering, and speeding. The null hypothesis was rejected for correlated qualities but not rejected for uncorrelated ones.

5.2 Recommendations

5.2.1 Operational Recommendations

- 1) **Develop and diligently implement a management plan:** No plan currently exists to guide visitor or destination management in MMNR. The proposed management plan will enable land-use zoning for tourism; in high, medium, and low-use tourist areas, popular wildlife viewing zones and tracks versus closed and restricted areas and tracks to manage visitor impacts and ensure the MMNR ecosystem's sustainability. In addition, the management plan will provide guidelines on visitor management, ecosystem, and species conservation strategies, including NI.
- 2) **Visitor data collection and dissemination:** Visitor trends data was not available. This indicated a gap in visitor data collection and dissemination. Visitor data should be collected to monitor trends and guide the reserve's strategic management to enable science-based strategic management of the MMNR. This includes visitor profile data age, type of vehicle used, the purpose of the visit, duration of stay, nationality, age, and gender. Visitor profiling will guide product development and positioning of the MMNR as a premium tourism destination for old and new visitor markets.
- 3) **Consolidate MMNR operational management:** It was established that the two areas, although legally under the MMNR, they are currently managed differently, with differing priorities and outcomes in conservation and NI initiatives. Where the Mara Conservancy manages the Mara Triangle, and The County Government of Narok manages the Greater Mara. This situation generates confusion, conflicting strategies and initiatives, differing enforcement regimes and visitor experiences. As such, the Greater Mara and the Mara Triangle management and administration should be collapsed into one management structure for the MMNR. This will also provide for better equipping, staffing, remuneration and motivation of wildlife rangers to enforce compliance as done at the Mara triangle.

- 4) **Diligent implementation of NI:** Persistence in implementing NI strategies will deliver long-term benefits to a destination. In so doing, NI will be effective instead of adopting a '*laissez-faire*' or reactive approach in visitor management. The study, therefore, recommends the proactive implementation of NI strategies, evaluation, and continual improvement to be in place.

Road and trail signage improvement: Road and trail signage are poor in the Greater Mara relative to the Mara Triangle. The results depicted that more visitor codes, display boards, and directional signage were needed, especially the visitor codes that were significantly few and visitor information centres that were essentially nonexistent in The Greater Mara. There is a bigger room for improvement in the development of better signage and numbering of road junctions, which will facilitate the ease of navigation by visitors within the MMNR. Visitor codes, display boards, orientation signage, and visitor information points should be strategically located, straightforward, and easy to read.

Digitising NI and visitor information: With the wide use and ownership of portable digital communication devices like mobile phones and tablets coupled with growing internet access, a mobile app and website dedicated to MMNR are essential for information dissemination and NI. A scannable Quick Response (QR) code poster can be mounted at all entry and alighting areas within the reserve to enhance awareness creation from the comfort of the visitors' portable device within the MMNR and beyond. This will help promote conservation ethics beyond the MMNR and other wildlife-based destinations. In this regard, MMNR does not have a dedicated website, and the study thus recommended designing and deploying an official website for MMNR. The website will play a dual role in providing the product and experience offered at MMNR and essential NI information and initiatives.

Construct and equip information centres: Study results revealed that visitor information centres were significantly few or did not exist for the Mara Triangle and Greater Mara, respectively. As the visitor receptacle, the entry gates can be used as an area of first contact for interpretative information and objects. Wildlife artefacts and trophies can be used as objects of interpretation in addition to maps, charts, or other print and electronic media of choice to facilitate visitor information and awareness creation before and after entry.

- 5) **Provide support infrastructure for NI:** The study proposes physical barriers several meters from Mara River along the wildlife migration crossing points. It can include creating wildlife-

friendly trenches and signage to control vehicles driving too close to the river crossing points. Currently, wildlife vehicles drive up to the river banks, and they overcrowd crossing points to witness the migration and thus hinder the free movement, confusing and distressing wildlife during the crossing.

Amenities like visitor information signages, permanent all-weather picnic site seats and chairs, toilets, and pest-proof dust bins are required at designated areas like the *Look-out* and the expansive balloon safaris region for visitor comfort and waste management. Especially when the guests are away from the lodges accommodating them, these amenities supplement those available at the gate areas. The study established that most driver guides were not eager to take their visitors to use washrooms in accommodations they were not booked into, nor were some lodges keen to host unregistered guests to use their facilities.

- 6) **Monitoring and enforcement should be differentiated by time of day:** The study established that most reserve rules or visitor codes of conduct were disregarded in the morning hours, especially animal harassment, driving too close to wildlife, overcrowding, off-road driving, or extended stay at a sighting occurred in the morning hours. The study recommends more patrols and enforcement in the morning compared to the afternoon or early evening because most wildlife viewers had ample time to view wildlife in the morning when wild animals were more active and exciting than the rest of the day.
- 7) **Monitoring and surveillance over big cats to contain animal harassment:** Big cats like lions, leopards, and cheetahs that tourists and tour drivers seek highly require enhanced management to control potential overcrowding and harassment during wildlife viewing and photography. As the day progressed, all these behaviour attributes reduced marginally. Big cats face the greatest danger of ecological disruption, habituation, and threatened survival rates. This scenario is already evident amongst the cheetah populations, which have been reported to have a very low survival rate. Leopards' numbers are also reported as not growing significantly within the MMNR.
- 8) **Regular training and awareness creation:** As conservation and visitor management ambassadors, regular training and awareness creation amongst tour driver guides are critical for improving competency, delivering professional services, and ensuring the reserve's sustainability. Therefore, tour guides need an understanding of their role in MMNR or destination management as they are crucial stakeholders and pass on this conservation ethics

to their clients, particularly the wildlife viewers. As users of MMNR for touristic purposes, tour guides require professional tour guide training and a basic understanding of conservation and reserve management. The training is envisaged to enable tour guides to provide quality NI and better understand reserve management and support.

Tour guides are some tourism sector staff that spend much time with visitors during their safari vacation. As such, they act as destination ambassadors and provide a link and a personal touch critical in destination behaviour regulation. Accordingly, the research proposed developing a new training programme, including but not limited to laws regulating tour guiding, professional code of conduct, customer care, and public relations. Natural history, identification and distribution of wildlife, wilderness navigations, safety, and survival techniques, wildlife behaviour and managing wildlife encounters, conservation, and protected area management are the other critical topics from the study findings.

- 9) **Community awareness creation on park management and alternative sustainable livelihoods:** The park administration should work with local community leadership structures and develop goodwill to stem cattle incursions and illegal grazing within the reserve. Developing other sustainable income-generating activities to support local livelihoods by diversifying community-based tourism is a viable alternative. Vibrant community-based tourism, where locals own and manage tourism resources around the MMNR, is a better alternative to yield better fruits. It is a better option in the long run instead of the local community keeping large herds of cattle per household, which exerts pressure to land resources that have become scarce as the human population increases around the MMNR.

5.2.2 Policy Recommendations

- 1) **Regulation of tour guides through associations:** Driver guides were likelier to flout reserve rules than tourists using ordinary vehicles. This finding implied that driver guides had visited the reserve several times, becoming complacent, which was not unique to MMNR and a common challenge to most wildlife tourism destinations. Strict regulation of tour guides thus becomes a necessity. The study recommends that all practising tour guides must be members of tour guide associations as stipulated by Kenya's tourism licensing regulations as an avenue to easily manage notorious wayward tour guides by penalising individual guides or their associations. Membership should be mandatory to enhance professionalism and avoid too many unmanageable freelance tour guides. Kenya's Tourism Regulatory Authority should strictly enforce tour guide licensing for all practising guides.

- 2) **Competency-based evaluation for practising tour guides without formal tourism training.** Although quantitative results implied that tour guides were competent in discharging their duties, qualitative findings indicated much room for improvement. Good professional training and meeting appropriate practising requirements stipulated in Kenyan laws and statutes should be a requirement for all tour guides in MMNR. For practising tour guides lacking formal tourism training, an appropriately designed competency-based training and evaluation framework can be developed to facilitate licensing freelance community guides with tour guiding experience.
- 3) **Tourist destination management plan:** MMNR, among other wildlife-based tourism destinations, must have management plans that serve as a blueprint for management and administrative programmes. This proposal is envisaged to make destination management plans a legal requirement to guide and ensure the sustainable development of MMNR among other wildlife tourism destinations.

As part of the destination management plan, general visitor data collection and dissemination should be mandatory. This data will enable effective destination management, research planning, development, and marketing. The Ministry of tourism and wildlife should make it mandatory for attractions to collect and disseminate general visitor trends. Visitor flow and trends will not only enhance accountability but also guide in destination planning and management.

5.2.3 Future Research

- 1) Tour vehicle dispersion and impact density mapping using navigation-based tracking devices will enable accurate impact mapping and resource use planning, including roads and tracks. The results will assist in more accurate use and impact zoning management strategies.
- 2) Impact of formal tour guide training on the professional performance of local community freelance/ step-on guides at MMNR. It was observed that some local community guides lack formal tour guide training. Most of these guides were observed to provide tour guiding services as docents or step-on guides, especially for self-drive tourists who hire their services informally at entry points.

5.3 New Scientific Findings

5.3.1 Effects of Demographic Characteristics on Behaviour

- a) The month of visit, nationality, gender, age, education level, and vehicle type hardly affected the effectiveness of NI techniques. Visit month, gender, age, education level, and vehicle type did not correlate with NI, making wildlife viewers support conservation areas financially.
- b) Contrary to popular opinion, education level did not affect support for NI.
- c) NI got less support as the year progressed from low to high season and vice versa. This finding was established by weak inverse relationships between wildlife viewers' support for NI and the month of visitation into MMNR.
- d) Support for NI decreased as respondents aged at MMNR. Young individuals favoured NI and were more conscious of conservation issues.
- e) Visitors on self-drive supported NI more than driver guides. These findings contradict previous studies that showed knowledgeable tour operators were more responsible than the un-trained.

5.3.2 Effect of Tour Guiding Delivery on Wildlife Viewer's Behaviour

- a) Study responses endorsed tour guides for excellent wildlife knowledge, good tour-leading skills, insightful NI, and visitor dos and do-nots at MMNR.
- b) The study conducted a simple training needs analysis and six important thematic areas to be included in a new MMNR tour guide training curriculum and ranked by their weighted frequencies. These were codes of conduct and laws regulated tour guiding, customer care and public relations, identification, natural history, animal distribution, wilderness navigations, safety, and survival tactics. Other topics included wildlife behaviour, interactions, conservation, and protected area administration.

5.3.3 Effect of Non-Personal NI on Behaviour Exhibited

- a) Tourist pressure for better wildlife views and photography and the desire of tour guides to deliver a pleasant experience was the main reason for not following the rules and orientation information in MMNR.
- b) NI that made wildlife viewers act responsibly did not correlate with Non-personal NI were too many. Thus, non-personal NI works regardless of quantity and should be positioned strategically, clearly, and easily read. Acting responsibly not to impact attractions, supporting

wildlife interpretation, satisfying experience, and following visitor codes and directional signage did not correlate with visitor codes, 'display boards, and 'directional signs

- c) Wildlife viewers' support for NI efforts did not correlate with the availability of non-personal NI.
- d) The study used open-ended questionnaire items to assess NI in MMNR, and nine strong points were identified. These included wildlife, park conservation and management, tour guidance, a satisfying experience, the big five, wildebeest migration, visitor codes, directional signage, and roads and trails. Seven NI weaknesses in MMNR were found; tour guiding, insufficient law enforcement, limited/poor signage, and the absence of an information centre were closely related to NI. Park management and conservation lack amenities and poor roads and trails.

5.3.4 NI Impact on Wildlife Viewers' Spatial Behaviour Patterns

- a) Although small and large wildlife were abundant in MMNR, they were less viewed than large cats, making them seem less valuable or viewed while vehicles were moving. Big cats were a significant attraction owing to their spectacular hunts, killings, feeding, and resting around their killing. Resting in the same spot for an extended period of the day made them easily accessible to many wildlife viewers and vehicles through referrals.
- b) Despite visitor guidelines stipulating a 25-meter distance from animals, 46.7% of MMNR wildlife viewers drove too close. Tour guides drove too close to animals or surrounded them with many vehicles as wildlife lovers sought a better experience.
- c) 75.3% of tour vehicles spend less than 15 minutes at animal sightings, which was fine. Any lengthy stay can lead to animal habituation and harassment. These notwithstanding, 25% of tour vehicles stayed beyond 16 minutes. The longer a sighting lasted, the more likely congestion and wildlife disturbance would occur. In addition, because big cats attract more vehicles and guests, these species were often overcrowded and harassed.
- d) The month of visiting did not alter tour guides' respect for other reserve users, littering, or speeding. However, as the year progressed, the number of tourists in wildlife viewing groups, length at a sighting, off-road driving, and harassment of wild animals decreased. Visitors' duration at a sighting dropped as the year advanced into the high season when a shorter duration was experienced relative to the low season.

- e) As the number of tourists or vehicles at a wildlife sighting increased, the distance between vehicles and the big cats decreased. Overcrowding was linked to big cats, not large or small wildlife. Overcrowding at wildlife sightings increased/ encouraged off-road driving and noisemaking, not respecting other vehicles, ecological harm, wildlife harassment, and disorderly conduct.
- f) The time wildlife viewers headed out for game viewing, the type of wildlife sought, and the distance from nature at a sighting all influenced their monthly behaviour patterns. The number of tourists and vehicles at a wildlife sighting, overcrowding, wildlife category, duration and distance, off-road driving, harassing wild animals, generating noise, and breaking speed limits were linked with observation time. As the day progressed, off-road driving, the number of vehicles, and the duration of sightings dropped.
- g) Except for restricted access areas, these statistics indicate that the entire MMNR is visited by high numbers of tourists, thus portending the danger of negative impacts. The Upper Mara Triangle Governors Camp, Mara Intrepid Explorer Rekeru, Central Mara Triangle -Serena Area, the Lower Mara Triangle Tanzania Border, Keekerok lodge to Sand River area, and Mara Simba to Talek regions can be categorised as medium-use zones. On the other hand, the Meta plains, Mara Bridge and Border Viewpoint, and Keekerok Airstrip -Mara Hippo -Sarova Regions are high tourist use zones.

SUMMARY

High visitation to destinations generates revenue but also threatens the sustainability of tourism's natural resources. NI has been employed as a non-obtrusive visitor management technique using tour guides, maps, information centres, and orientation signs to convey information while recognising its impact on protected areas and tourist activities and behaviour (Haring (2014)). However, the effectiveness of NI is rarely monitored. Many parties with varied goals apply NI in diverse ways as a visitor management approach complicates the situation. Thus given the vastness of MMNR, does NI regulate visitor and driver-guide behaviour in MMNR?

This study investigated how the demographics of wildlife viewers affected MMNR behaviour (H₀1). The mixed correlations between wildlife viewer demographics and behaviour variables partially supported the hypothesis. Most of these findings were weak and marginal, and the hypothesis was largely partially not rejected. Wildlife viewers supported NI efforts correlated with the type of vehicle used, gender, nationality, the month of visit, and education level. On the hand, wildlife viewers supported NI efforts that did not correlate with age and the purpose of the visit. A very weak relationship was established between the type of vehicle used and gender versus wildlife viewers' financial support for conservation areas. Nationality and the purpose of the visit influenced wildlife viewers to get a satisfying experience after interacting with NI. Age, the month of visit, education level, nationality, gender, and the type of vehicle used did not influence wildlife viewers' ability to get a satisfying experience after interacting with NI. Consequently, where no correlation existed, the null hypothesis was not rejected, and correlations existed alternate accepted.

The second hypothesis tested how tour guide competence and wildlife viewer behaviour. Mainly weak correlations were yielded. All wildlife viewers' behaviour attributes correlated with all the tour guide competency attributes, and thus the null hypothesis was rejected. These behaviour attributes were that wildlife viewers were more enlightened about nature and wildlife, acted responsibly not to impact attractions, observed visitor codes and directional signage, supported NI efforts, financially supported conservation areas and got a satisfying experience. The only exception was the paired correlation between wildlife viewers supported NI efforts versus tour guides requiring regular interpretation training and sensitisation that did not correlate and thus the null hypothesis was not rejected. Despite these modest and very weak connections, the study results agreed somewhat with past research, thus, respondents recommended a new training programme. The third objective was to establish how non-personal forms of NI affect the

behaviour of wildlife viewers. All wildlife viewers' behaviour attributes correlated with non-personal NI attributes are strategically located, appropriate, visible, easy to read and understand, and communicated to tourists by tour guides. These behaviour attributes were that wildlife viewers were more enlightened about nature and wildlife, acted responsibly not to impact attractions, observed visitor codes and directional signage, supported NI efforts, financially supported conservation areas and got a satisfying experience. On the other hand, too many non-personal forms of NI did not correlate with wildlife viewers acting responsibly not to impact attractions, observing visitor codes and directional signage, supporting NI efforts or getting a satisfying experience.

The fourth hypothesis was establishing spatial viewing behaviour patterns amongst wildlife viewers at MMNR. Observations month, observation time, number of tourists in the group, number of vehicles at a sighting, overcrowding at a sighting, wildlife category, estimated distance from the wildlife, duration at a sighting, driver respects other reserve users, off-road driving in restricted areas, harass wild animals had weak correlations amongst themselves. The null hypothesis was thus largely rejected, with the major exception being the observation attributes wildlife viewers litter and hooting/ making noise which did not correlate. Thus the null hypothesis was not rejected. Largely, there were spatial behaviour patterns exhibited by wildlife viewers at MMNR. The research recommended that MMNR develop and diligently implement a management plan and consolidate its operational management. Persistence in implementing NI programmes; road and trail signage; digitizing NI and visitor information, building and equipping information centres, providing nature interpretive infrastructure, monitoring and enforcement for compliance. Lastly, legislate and ensure tour guides are association-regulated and mainstream competency-based evaluation methodology for non-trained tour guides.

REFERENCES

- Ababneh, A. (2017). Heritage Interpretation: Analysis Study of the Signage System Used at the Archaeological Site of Umm Qais in Northern Jordan. *Tourism Planning and Development*, 14(3). <https://doi.org/10.1080/21568316.2016.1204361>
- Adeola, A., & Aderemi, A. A. (2016). Rural Tourism Entrepreneurship as Strategy for Economic Development in Nigeria. *Scholedge International Journal of Management & Development* ISSN 2394-3378. <https://doi.org/10.19085/journal.sijmd030901>
- Akama, J., & Kemboi, D. (2002). The development of cultural tourism in Kenya: a case study of the Bomas of Kenya. In J. S. Akama & P. Sterry (Eds.), *Cultural tourism in Africa: strategies for the new millennium*. Association for Tourism and Leisure Education. [http://www.atlas-euro.org/pages/pdf/Cultural tourism in Africa Deel 1.pdf](http://www.atlas-euro.org/pages/pdf/Cultural%20tourism%20in%20Africa%20Deel%201.pdf)
- Akoglu, H. (2018). User's guide to correlation coefficients. *Turkish Journal of Emergency Medicine*, 18(3), 91–93. <https://doi.org/10.1016/j.tjem.2018.08.001>
- Alazaizeh, M., & Hallo, J. (2017). Indicators and standards-based visitor management frameworks in achieving sustainability at cultural heritage sites. In *Visitor management in tourism destinations* (pp. 45–58). CABI. <https://doi.org/10.1079/9781780647357.0045>
- Alazaizeh, M. M., Jamaliah, M. M., Mgonja, J. T., & Ababneh, A. (2019). Tour guide performance and sustainable visitor behavior at cultural heritage sites. *Journal of Sustainable Tourism*, 27(11), 1708–1724. <https://doi.org/10.1080/09669582.2019.1658766>
- Albrecht, J. N. (2017). Introduction to Visitor Management in Tourism Destinations. In J. N. Albrecht (Ed.), *Visitor management in tourism destinations* (pp. 3–8). CABI. <https://doi.org/10.1079/9781780647357.0003>
- Ali, M., & Obaid, A. (2014). Destination Loyalty and preference to Oman: Examining the Influences of Tourists' Demographics. *Association of Arab Universities for Tourism and Hospitality*, 140–152.
- Allbrook, D. L., & Quinn, J. L. (2020). The effectiveness of regulatory signs in controlling human behaviour and Northern gannet (*Morus bassanus*) disturbance during breeding: an experimental test. *Journal for Nature Conservation*, 58. <https://doi.org/10.1016/j.jnc.2020.125915>

- Amin, V. L., & Yok, M. C. K. (2015). Thematic Interpretation Approach in Environmental Adult Education. *Procedia - Social and Behavioral Sciences*, 167, 261–266. <https://doi.org/10.1016/j.sbspro.2014.12.672>
- Babbie, E. R. (2016). *The Practice of Social Research* (14th ed.). Cengage Learning.
- Benkhard, B., Előd, R., & Mártonné, E. (2018). Restrictions or possibilities?: Visitor management in the Börzsöny landscape unit of Danube-Ipoly National Park (Hungary). *Turizam*, 22(3), 84–94. <https://doi.org/10.5937/turizam22-18798>
- Bhandari, M. (2014). Is Tourism Always Beneficial? A Case Study from Masai Mara National Reserve, Narok, Kenya. *Pacific Journal of Science and Technology*.
- Bhati, A., & Pearce, P. (2017). Tourist behaviour, vandalism and stakeholder responses. In *Visitor management in tourism destinations* (pp. 102–116). CABI. <https://doi.org/10.1079/9781780647357.0102>
- Borges, de L. I. (2016). Pivotal Role of Tour Guides for Visitors' Connection with Nature: Conceptual and Practical Issues. *International Journal of Humanities and Applied Sciences*, 5(1).
- Borges, de L. I. (2017). Wildlife Resources, Habitats and Ecosystems for Visitors' Experiential Learning: Educative Wildlife Tourism in the Australian Context. In I. de Lima & R. J. Green (Eds.), *Wildlife Tourism, Environmental Learning and Ethical Encounters: Ecological and Conservation Aspects* (pp. 113–154). Springer International Publishing. https://doi.org/10.1007/978-3-319-55574-4_8
- Borges, D. L., & Ronda, J. G. (2017). Wildlife Tourism, Environmental Learning and Ethical Encounters. In I. Borges de Lima & R. J. Green (Eds.), *Springer International* (Vol. 11, Issue 2007). Springer International Publishing. <https://doi.org/10.1007/978-3-319-55574-4>
- Buckley, R., Zhong, L., & Ma, X. (2017). Visitors to protected areas in China. *Biological Conservation*. <https://doi.org/10.1016/j.biocon.2017.01.024>
- Buhalis, D. (1999). Tourism on the Greek Islands: Issues of peripherality, competitiveness and development. *International Journal of Tourism Research*, 1(5), 341–358. [https://doi.org/10.1002/\(SICI\)1522-1970\(199909/10\)1:5<341::AID-JTR201>3.0.CO;2-0](https://doi.org/10.1002/(SICI)1522-1970(199909/10)1:5<341::AID-JTR201>3.0.CO;2-0)

- Bushell, R., & Bricker, K. (2017). Tourism in protected areas: Developing meaningful standards. *Tourism and Hospitality Research*. <https://doi.org/10.1177/1467358416636173>
- Candrea, A. N., & Ispas, A. (2009). Visitor Management, A Tool for Sustainable Tourism Development in Protected Areas. *Bulletin of the Transilvania University of Brasov. Series V: Economic Sciences*, 2(51), 131–136. <http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=59309055&site=ehost-live&scope=site>
- Cárdenas, S. A., & Lew, D. K. (2016). Factors Influencing Willingness to Donate to Marine Endangered Species Recovery in the Galapagos National Park, Ecuador. *Frontiers in Marine Science*, 3(MAY). <https://doi.org/10.3389/fmars.2016.00060>
- Carmody, J. (2013). Intensive tour guide training in regional Australia: an analysis of the Savannah Guides organisation and professional development schools. *Journal of Sustainable Tourism*, 21(5). <https://doi.org/10.1080/09669582.2012.744412>
- Carranza, T., Manica, A., Kapos, V., & Balmford, A. (2014). Mismatches between conservation outcomes and management evaluation in protected areas: A case study in the Brazilian Cerrado. *Biological Conservation*. <https://doi.org/10.1016/j.biocon.2014.03.004>
- Carvalho, V. do C., Camargo, F. F., & Leite Fontes, M. A. (2015). A interpretação da natureza e sua aplicação por agentes do ecoturismo no Mato Grosso. *Revista Brasileira de Ecoturismo (RBEcotur)*, 8(5). <https://doi.org/10.34024/rbecotur.2015.v8.6459>
- Ceballos-Lascuráin, H. (1996). *Tourism, ecotourism, and protected areas*. IUCN. <https://doi.org/10.2305/IUCN.CH.1996.7.en>
- Çetinkaya, M. Y., & Öter, Z. (2016). Role of tour guides on tourist satisfaction level in guided tours and impact on re-visiting Intention: a research in Istanbul. *European Journal of Tourism, Hospitality and Recreation*, 7(1). <https://doi.org/10.1515/ejthr-2016-0005>
- Chen, J. S., & Prebensen, N. K. (2017). Nature Tourism. In J. S. Chen & N. K. Prebensen (Eds.), *Nature Tourism*. Routledge. <https://doi.org/10.4324/9781315659640>
- Ching, G. H., & Wan Mohamad Ariffin, W. N. S. (2019). The Effectiveness of Environmental Interpretation in Influencing Visitors' Knowledge in Kinabalu Park. *Asian Journal of Environment-Behaviour Studies*, 4(13). <https://doi.org/10.21834/aje-bs.v4i13.344>

- County Government of Narok (CGN). (2020). *Masai Mara Visitation Trends 2018-2019*. County Government of Narok.
- County Government of Narok. (2018). COUNTY INTEGRATED DEVELOPMENT PLAN FOR NAROK COUNTY-2018-2022.
- Creswell, J. W., & Poth, C. N. (2018). Qualitative inquiry & research design; Choosing among five approach. In *SAGE Publications, Inc.* <https://doi.org/10.1017/CBO9781107415324.004>
- D'Antonio, A., & Monz, C. (2016). The influence of visitor use levels on visitor spatial behavior in off-trail areas of dispersed recreation use. *Journal of Environmental Management*. <https://doi.org/10.1016/j.jenvman.2016.01.011>
- Dayananda K C, & Leelavathi, P. D. S. (2016). Evolution of Tourism Policy in India: An overview. *IOSR Journal Of Humanities And Social Science (IOSR-JHSS)*. <https://doi.org/10.9790/0837-2112013743>
- Dell'Eva, M., Nava, C. R., & Osti, L. (2020). Perceptions and satisfaction of human–animal encounters in protected areas. *Worldwide Hospitality and Tourism Themes*, 12(4). <https://doi.org/10.1108/WHATT-05-2020-0024>
- Dunets, A. N., Gerasymchuk, N. A., Kurikov, V. M., Noeva, E. E., Kuznetsova, M. Y., & Shichiyakh, R. A. (2020). Tourism management in border destinations: Regional aspects of sustainable development of protected natural areas. *Entrepreneurship and Sustainability Issues*, 7(4). [https://doi.org/10.9770/jesi.2020.7.4\(45\)](https://doi.org/10.9770/jesi.2020.7.4(45))
- Durao, M., & Joao, C. (2017). Strategies for successful interpretation techniques in visitor attractions: The operationalisation of guided tourism in museums. In J. N. Albrecht (Ed.), *Visitor management in tourism destinations* (pp. 131–150).
- Eagles, P. F. J., Coburn, J., & Swartman, B. (2014). Plan quality and plan detail of visitor and tourism policies in Ontario Provincial Park management plans. *Journal of Outdoor Recreation and Tourism*, 7–8, 44–54. <https://doi.org/10.1016/j.jort.2014.09.006>
- Edinburgh, P., Frew, E. a., Hodgson, L., & Wearing, S. (2008). *Enhancing visitor experience through interpretation: An examination of influencing factors*. <https://doi.org/338.479194>
- Fakana, S. T., & Mengist, A. B. (2019). Unexplored Natural Tourism Potentials: Gambella People's National Regional State, South West Ethiopia. *International Journal of Scientific and*

- Fang, C., Yamanaka, Y., & Trencher, G. (2021). Arrival briefings as an effective interpretation strategy in tourist destinations: The case of Daisetsuzan National Park, Japan. *Journal of Outdoor Recreation and Tourism*, 33, 100363. <https://doi.org/10.1016/j.jort.2020.100363>
- Farrell, T. A., & Marion, J. L. (2002). The Protected Area Visitor Impact Management (PAVIM) Framework: A Simplified Process for Making Management Decisions. *Journal of Sustainable Tourism*, 10(1), 31–51. <https://doi.org/10.1080/09669580208667151>
- Farr, M. T., Green, D. S., Holekamp, K. E., Roloff, G. J., & Zipkin, E. F. (2019). Multispecies hierarchical modeling reveals variable responses of African carnivores to management alternatives. *Ecological Applications*, 29(2). <https://doi.org/10.1002/eap.1845>
- Fishbein, M., & Ajzen, I. (2010). *Predicting and changing behavior: The reasoned action approach*. Psychology Press.
- Fletcher, J., Fyall, A., Gilbert, D., & Wanhill, S. (2018). *Tourism: Principles and Practice 6th Edition* (16th ed.). Pearson.
- Freeman, S., Taff, B. D., Miller, Z. D., Benfield, J. A., & Newman, P. (2021). Acceptability factors for wildlife approach in park and protected area settings. *Journal of Environmental Management*, 286. <https://doi.org/10.1016/j.jenvman.2021.112276>
- Frost, W., Laing, J., & Beeton, S. (2014). The Future of Nature-Based Tourism in the Asia-Pacific Region. *Journal of Travel Research*. <https://doi.org/10.1177/0047287513517421>
- Fung, C. K. W., & Jim, C. Y. (2015). Unraveling Hong Kong Geopark experience with visitor-employed photography method. *Applied Geography*, 62, 301–313. <https://doi.org/10.1016/j.apgeog.2015.05.014>
- Geng, D. C., Innes, J. L., Wu, W., Wang, W., & Wang, G. (2021). Seasonal variation in visitor satisfaction and its management implications in banff national park. *Sustainability (Switzerland)*, 13(4). <https://doi.org/10.3390/su13041681>
- Ghosh, S., Arvind, D. G., & Dobbie, S. (2019). Evaluation of microclimates and assessment of thermal comfort of Panthera leo in the Masai Mara National Reserve, Kenya. *International Journal of Biometeorology*, 63(3), 269–279. <https://doi.org/10.1007/s00484-018-01660-3>

- Gnanapala, Pathirana K. Athula, D. P. U. T., & Athula, W. K. (2015). Tourists' Harassment at Cultural Sites in Sri Lanka. *Tourism, Leisure and Global Change*.
- Goeldner, C., & Ritchie, B. (2009). Tourism: Principles, Practices and Philosophies. In *Tourism*. <https://doi.org/10.1159/000470892>
- Goh, H. C., & Rosilawati, Z. (2014). Conservation education in kinabalu park, malaysia: Analysis of visitors' satisfaction. *Journal of Tropical Forest Science*.
- Gosal, A. S., McMahon, J. A., Bowgen, K. M., Hoppe, C. H., & Ziv, G. (2021). Identifying and mapping groups of protected area visitors by environmental awareness. *Land*, 10(6). <https://doi.org/10.3390/land10060560>
- Grace, M. K., Smith, D. J., & Noss, R. F. (2017). Reducing the threat of wildlife-vehicle collisions during peak tourism periods using a Roadside Animal Detection System. *Accident Analysis and Prevention*, 109. <https://doi.org/10.1016/j.aap.2017.10.003>
- Green, D. S., Zipkin, E. F., Incorvaia, D. C., & Holekamp, K. E. (2019). Long-term ecological changes influence herbivore diversity and abundance inside a protected area in the Mara-Serengeti ecosystem. *Global Ecology and Conservation*, 20, e00697. <https://doi.org/10.1016/j.gecco.2019.e00697>
- Grünewald, C., Schleuning, M., & Böhning-Gaese, K. (2016). Biodiversity, scenery and infrastructure: Factors driving wildlife tourism in an African savannah national park. *Biological Conservation*, 201. <https://doi.org/10.1016/j.biocon.2016.05.036>
- Gulati, S. (2021). Social and sustainable: exploring social media use for promoting sustainable behaviour and demand amongst Indian tourists. *International Hospitality Review, ahead-of-print*(ahead-of-print). <https://doi.org/10.1108/ihr-12-2020-0072>
- Hall, C., & McArthur, S. (1998). Visitor Management and Interpretation: Principles and Practice. *Heritage Management in New Zealand and Australia: Visitor Management, Interpretation, and Marketing*, 18–39. <https://www.semanticscholar.org/author/Michael-C.-Hall/38407368>
- Hall, C. M., & Page, S. (2010). The contribution of Neil Leiper to tourism studies. *Current Issues in Tourism*, 13(4), 299–309. <https://doi.org/10.1080/13683500.2010.482652>
- Ham, S. H., & Sandberg, E. K. (2012). Interpretation as Strategic Communication in Protected Area Management. In P. Fredman, M. Stenseke, H. Liljedahl, A. Mossing, & L. Daniel (Eds.),

The 6th International Conference on Monitoring and Management of Visitors in Recreational and Protected Areas (pp. 132–133).

- Ham, S. H., Weiler, B., Hughes, M., Brown, T. J., Curtis, J., & Poll, M. (2008). Asking visitors to help: Research to guide strategic communication for protected area management sustainable tourism. *Russell The Journal Of The Bertrand Russell Archives*.
- Haring, D. S. D. (2014). *Effective interpretation for recreational marine resource use in the Mombasa Marine Park and Reserve, Kenya* [James Cook University, Townsville, Australia]. <http://researchonline.jcu.edu.au/40679/>
- Hathcoat, J. D., Meixner, C., & Nicholas, M. C. (2019). Ontology and Epistemology. In P. Liamputtong (Ed.), *Handbook of Research Methods in Health Social Sciences* (pp. 99–116). Springer Singapore. https://doi.org/10.1007/978-981-10-5251-4_56
- Healy, N., van Riper, C. J., & Boyd, S. W. (2016). Low versus high intensity approaches to interpretive tourism planning: The case of the Cliffs of Moher, Ireland. *Tourism Management*. <https://doi.org/10.1016/j.tourman.2015.08.009>
- Hoan, N. C. (2015). Tourism Destination Products Management – Case Studies of Phu Quoc Island Kien Giang Province, Vietnam by 2020. *Universal Journal of Management*, 3(12), 509–513. <https://doi.org/10.13189/ujm.2015.031205>
- Holden, A., & Fennell, D. (2012). The routledge handbook of tourism and the environment. In *The Routledge Handbook of Tourism and the Environment*. <https://doi.org/10.4324/9780203121108>
- Holmes, A. P., Grimwood, B. S. R., & King, L. J. (2016). Creating an Indigenized visitor code of conduct: the development of Denesoline self-determination for sustainable tourism. *Journal of Sustainable Tourism*, 24(8–9), 1177–1193. <https://doi.org/10.1080/09669582.2016.1158828>
- Hovardas, T., Togridou, A., & Pantis, J. D. (2011). *Environmental education as a crucial component of the environmentalist dimension of ecotourism: Inducing short-term effects on environmental literacy with long-term implications for protected area management* (A. Krause & E. Weir, Eds.). Nova Science Pub Inc.

- Huang, S. (Sam), Weiler, B., & Assaker, G. (2015). Effects of Interpretive Guiding Outcomes on Tourist Satisfaction and Behavioral Intention. *Journal of Travel Research*. <https://doi.org/10.1177/0047287513517426>
- Huertas, H. A., Ballera, B. L. G. B., Toro-Manríquez, M. D. R., Lencinas, M. v., Martínez, P. G. J., & Ram, H. H. (2021). Changes in vegetation of flooded savannas subject to cattle grazing and fire in plains of Colombia. *Land*, *10*(2). <https://doi.org/10.3390/land10020108>
- Hughes, M., & Morrison-Saunders, A. (2005). Influence of On-site Interpretation Intensity on Visitors to Natural Areas. *Journal of Ecotourism*, *4*(3), 161–177. <https://doi.org/10.1080/jJET.v4.i3.pg161>
- Hurdle, J. (2019). *Off-Road drivers still battling conservationists over access to Pinelands*. New Jersey SpotLight. <https://www.njspotlight.com/2019/08/19-08-04-off-road-drivers-still-battling-conservationists-over-access-to-pinelands/>
- Ikiara, M., & Okech, C. (2002). *Impact of Tourism on Environment in Kenya: Status and Policy; KIPPRA Discussion Paper* (19th ed.). Kenya Institute for Public Policy Research and Analysis. <https://www.eldis.org/document/A21267>
- Inversini, A., Buhalis, D., & Pesonen, J. (2014). Agile Marketing for Tourism Destinations. *Academy of Marketing Conference 2014*.
- Irimiás, A., Mitev, A., & Michalkó, G. (2021). The multidimensional realities of mediatized places: the transformative role of tour guides. *Journal of Tourism and Cultural Change*, *19*(6). <https://doi.org/10.1080/14766825.2020.1748884>
- Jaafar, M., Kayat, K., Tangit, T. M., & Yacob, M. F. (2013). Nature-based rural tourism and its economic benefits: A case study of Kinabalu National Park. *Worldwide Hospitality and Tourism Themes*. <https://doi.org/10.1108/WHATT-03-2013-0016>
- Jafari, J., & Brent Ritchie, J. R. (1981). Toward a framework for tourism education. Problems and prospects. *Annals of Tourism Research*. [https://doi.org/10.1016/0160-7383\(81\)90065-7](https://doi.org/10.1016/0160-7383(81)90065-7)
- Jankovic, M., Luburic, V., & Sofranac, R. (2017). Sustainable tourism as a basis of management of national parks in Montenegro. *Ekonomika*. <https://doi.org/10.5937/ekonomika1704041j>

- Jennings, F. J. (2019). An uninformed electorate: identity-motivated elaboration, partisan cues, and learning. *Journal of Applied Communication Research*, 47(5), 527–547. <https://doi.org/10.1080/00909882.2019.1679385>
- Jerolmack, C., & Khan, S. (2014). Talk Is Cheap: Ethnography and the Attitudinal Fallacy. *Sociological Methods and Research*. <https://doi.org/10.1177/0049124114523396>
- Juma, L. O. (2016). *Nature Interpretation and Visitor Management in Protected Areas: An analysis of stakeholder attitudes*. Lambert Academic Publishing.
- Juma, L. O., Bakos, I. M., & Khademi-Vidra, A. (2020). Nature Interpretation and Visitor Management Objectives: A Survey of Tourist Attitudes at Maasai Mara National Reserve, Kenya. *Sustainability*, 12(18), 7246. <https://doi.org/10.3390/su12187246>
- Juma, L. O., & Khademi-Vidra, A. (2022). Nature Interpretation as an Environmental Educational Approach in Visitor Management; The Application Dilemma for Different Target Groups at Masai Mara National Reserve, Kenya. *Sustainability*, 14(5), 2935. <https://doi.org/10.3390/su14052935>
- Kabii, F., Okello, M. M., & Kipruto, N. (2017). Effects of Tour Guides Training on Their Performance in Kenya. *J. of Tourism and Hospitality Management*, 5(6). <https://doi.org/10.17265/2328-2169/2017.12.003>
- Kabii, F., Wandaka, J. K. M., & Jilo, N. (2019). Assessment of the impact of Smartphone Technology on Tour Guide Performance in Kenya. *International Journal of Social Science Research*. <https://doi.org/10.5296/ijssr.v7i2.15406>
- Kabii, F., Wandaka, J. K. M., Wamathai, A., & Jilo, N. (2019). The Role of Tour Guides in Promotion of Sustainable Tourism Practices in Kenya. *JOURNAL OF TOURISM AND HOSPITALITY MANAGEMENT*, 7(2). <https://doi.org/10.15640/jthm.v7n2a5>
- Kebete, Y., & Wondirad, A. (2019). Visitor management and sustainable destination management nexus in Zegie Peninsula, Northern Ethiopia. *Journal of Destination Marketing & Management*, 13, 83–98. <https://doi.org/10.1016/j.jdmm.2019.03.006>
- KENPRO. (2012, July 25). *Sample Size Determination Using Krejcie and Morgan Table - KENPRO*. Sample Size Determination Using Krejcie and Morgan Table. <https://www.kenpro.org/sample-size-determination-using-krejcie-and-morgan-table/>

- Kenya National Bureau of Statistics. (2019). 2019 Kenya Population and Housing Census. In *2019 Kenya Population and Housing Census: Vol. I* (Issue November).
- Kenya Tourist Board (KTB). (2012). *The Nairobi Safari Walk*. www.magicalkenya.com:www.magicalkenya.com/index.php?option=com_content&task=view&id=271&Itemid=415
- Kenya Wildlife Service. (2005). *Nairobi National Park Ecosystem Management Plan (2005-2010)*.
- Khanna, P. (2019). Positivism and Realism. In P. Liamputtong (Ed.), *Handbook of Research Methods in Health Social Sciences* (pp. 151–168). Springer Singapore. https://doi.org/10.1007/978-981-10-5251-4_59
- Kim, L., Jennifer, C., Binti, S., & Fiffy, H. (2021). Exploring tour operators' perspectives on responsible tourism at ecotourism destination: Meaning, motivation, and practices. *Asia-Pacific Journal of Innovation in Hospitality and Tourism*, *10*(1).
- Knight, J. (2009). Making wildlife viewable: Habituation and attraction. *Society and Animals*, *17*(2). <https://doi.org/10.1163/156853009X418091>
- Kubo, T., Mieno, T., & Kuriyama, K. (2019). Wildlife viewing: The impact of money-back guarantees. *Tourism Management*, *70*, 49–55. <https://doi.org/10.1016/j.tourman.2018.06.010>
- Kubo, T., & Shoji, Y. (2016). Demand for bear viewing hikes: Implications for balancing visitor satisfaction with safety in protected areas. *Journal of Outdoor Recreation and Tourism*, *16*. <https://doi.org/10.1016/j.jort.2016.09.004>
- Kuo, I. L. (2017). Theories of learning and their application in interpretation. In *Visitor management in tourism destinations* (pp. 159–169). CABI. <https://doi.org/10.1079/9781780647357.0159>
- Lee, T. H., & Jan, F. H. (2018). Ecotourism Behavior of Nature-Based Tourists: An Integrative Framework. *Journal of Travel Research*. <https://doi.org/10.1177/0047287517717350>
- Leiper, N. (1979). The framework of tourism. Towards a definition of tourism, tourist, and the tourist industry. *Annals of Tourism Research*, *6*(4), 390–407. [https://doi.org/10.1016/0160-7383\(79\)90003-3](https://doi.org/10.1016/0160-7383(79)90003-3)

- Leung, Y., Spenceley, A., Hvenegaard, G., Buckley, R., & Groves, C. (2018). Tourism and visitor management in protected areas : guidelines for sustainability - Best Practice Protected Area Guidelines Series n°. 27. In *Tourism and visitor management in protected areas: guidelines for sustainability*.
- Littlefair, C. J. (2003). The effectiveness of interpretation in reducing the impacts of visitors in National Parks. *National Parks*.
- Littlejohn, S., & Foss, K. (2012). Encyclopedia of Communication Theory. In *Encyclopedia of Communication Theory*. <https://doi.org/10.4135/9781412959384>
- Liu, Y., Li, J., & Sheng, S. (2021). Brand co-creation in tourism industry: The role of guide-tourist interaction. *Journal of Hospitality and Tourism Management*, 49. <https://doi.org/10.1016/j.jhtm.2021.09.019>
- Lóczy, D., & Ciglić, R. (2018). Nature conservation. In *Springer Geography*. https://doi.org/10.1007/978-3-319-92816-6_19
- Lück, M., & Porter, B. A. (2018). Tour guide training for hospitable nature-based tour experiences. *Hospitality Insights*, 2(2). <https://doi.org/10.24135/hi.v2i2.39>
- Maciejewski, K., & Kerley, G. I. H. (2014). Understanding Tourists' Preference for Mammal Species in Private Protected Areas: Is There a Case for Extralimital Species for Ecotourism? *PLoS ONE*, 9(2), e88192. <https://doi.org/10.1371/journal.pone.0088192>
- MacLeod, N. (2013). *The Routledge Handbook of Cultural Tourism* (M. Smith & G. Richards, Eds.). Routledge. <https://doi.org/10.4324/9780203120958>
- Magayu, M. (2014). Sustainability in Tourism Making tourism count to communities, ecosystems and businesses. *African Conference on Sustainable Tourism*, 1–17. <http://hdl.handle.net/11071/4957>
- Makopo, B. M., Geldenhuys, S., & Sime, L. (2018). The role of tourist guides in interpretation: A survey of secondary school teachers at Maropeng and the Sterkfontein caves, South Africa. *African Journal of Hospitality, Tourism and Leisure*.
- Mara Conservancy. (2023, February 4). Mara Wonders -Wildebeest Migration . <https://www.maratriangle.org/maratriangle/wildebeest-migration>

- Marschall, S., Granquist, S. M., & Burns, G. L. (2017). Interpretation in wildlife tourism: Assessing the effectiveness of signage on visitor behaviour at a seal watching site in Iceland. *Journal of Outdoor Recreation and Tourism*, 17, 11–19. <https://doi.org/10.1016/j.jort.2016.11.001>
- Masai Mara Wildlife Conservancies Association. (2022). *The Greater Mara Ecosystem*. <https://maraconservancies.org/the-greater-mara-ecosystem/>
- Maslovskaja, O., Kopeva, A., Petrova, E., Ivanova, O., & Khrapko, O. (2020). Development of ecotourism infrastructure at protected areas of Primorsky Krai. *IOP Conference Series: Materials Science and Engineering*, 890(1). <https://doi.org/10.1088/1757-899X/890/1/012002>
- Mason, P. (2005). Visitor Management in Protected Areas: From ‘Hard’ to ‘Soft’ Approaches? *Current Issues in Tourism*, 8(2–3), 181–194. <https://doi.org/10.1080/13683500508668213>
- Matolo, R. J., & Salia, P. J. (2017). Relationship between Tourists’ Expectations and Experiences: Empirical Evidences from Visitors to Serengeti National Park in Tanzania. *International Journal of Academic Research in Business and Social Sciences*, 7(8). <https://doi.org/10.6007/IJARBSS/v7-i8/3247>
- Mawioo, M. J., & Kagiri, A. W. (2015). Strategic Factors Influencing the Destination Choice for Domestic Tourists in Kenya. *International Journal of Science and Research (IJSR)*, 4(11), 279–285. <https://doi.org/10.21275/v4i11.NOV151062>
- Mayorga, M., Cable, T. T., & Mullins, C. (2017). Evaluation of Interpretive Media Use and Effectiveness at a Nature Center. *Journal of Interpretation Research*.
- Merriman, P. (2005). ‘Respect the life of the countryside’: the Country Code, government and the conduct of visitors to the countryside in post-war England and Wales. *Transactions of the Institute of British Geographers*, 30(3), 336–350. <https://doi.org/10.1111/j.1475-5661.2005.00175.x>
- McArthur, S., & Hall, C. (1996). Visitor management: principles and practice. *Heritage Management in Australia and New Zealand*, 37–51.

- McBride, K. A., MacMillan, F., George, E. S., & Steiner, G. Z. (2019). The Use of Mixed Methods in Research. In P. Liamputtong (Ed.), *Handbook of Research Methods in Health Social Sciences* (pp. 695–713). Springer Singapore. https://doi.org/10.1007/978-981-10-5251-4_97
- McIntosh, D., & Wright, P. A. (2017). Emotional processing as an important part of the wildlife viewing experience. *Journal of Outdoor Recreation and Tourism*, 18. <https://doi.org/10.1016/j.jort.2017.01.004>
- Mifsud, M. C. (2017). The Development and Evaluation of an Environmental Awareness Course Addressed to Student Tourist Guides in the Maltese Islands. In W. Leal Filho, L. Brandli, P. Castro, & J. Newman (Eds.), *Handbook of Theory and Practice of Sustainable Development in Higher Education: Volume 1* (pp. 333–347). Springer International Publishing. https://doi.org/10.1007/978-3-319-47868-5_21
- Mitchell, J., & Ryland, P. (2020). *Creating an Interpretation Plan: an introduction Natural interpretation: a guide to the interpretation of nature and wildlife*.
- Mohamadkhani, K., & Ashrafi, M. (2013). A Study on the Effectiveness of Tour Guides Training Programs in Iran-Tehran. *Business and Economic Research*, 3(1). <https://doi.org/10.5296/ber.v3i1.3289>
- Moñivas, J. R., Benton, T., & Craib, I. (2005). Philosophy of Social Science. The Philosophical Foundations of Social Thought. *Reis*, 112, 270. <https://doi.org/10.2307/40184720>
- Moscardo, G., & Pearce, P. L. (1986). Visitor centres and environmental interpretation: An exploration of the relationships among visitor enjoyment, understanding and mindfulness. *Journal of Environmental Psychology*, 6(2), 89–108. [https://doi.org/10.1016/S0272-4944\(86\)80011-1](https://doi.org/10.1016/S0272-4944(86)80011-1)
- Moyle, B. D., Scherrer, P., Weiler, B., Wilson, E., Caldicott, R., & Nielsen, N. (2017). Assessing preferences of potential visitors for nature-based experiences in protected areas. *Tourism Management*. <https://doi.org/10.1016/j.tourman.2017.03.010>
- Mucha, D., & Halpenny, E. (2012a). Exploring the human dimension: visitor use analysis of Park, Willmore Wilderness. In P. Fredman, M. Stenseke, H. Liljedahl, A. Mossing, & L. Daniel (Eds.), *The 6th International Conference on Monitoring and Management of Visitors in Recreational and Protected Areas* (pp. 388–389).

- Mucha, D., & Halpenny, E. (2012b). Using a Mixed-Methods Approach to Explore the Human Dimension of Willmore Wilderness Park, Alberta, Canada. In P. Fredman, M. Stenseke, H. Liljedahl, A. Mossing, & L. Daniel (Eds.), *The 6th International Conference on Monitoring and Management of Visitors in Recreational and Protected Areas, 6*, pp. 388-389. Stockholm, Sweden. (pp. 388–389).
- Múgica, L., Canals, R. M., San Emeterio, L., & Peralta, J. (2021). Decoupling of traditional burnings and grazing regimes alters plant diversity and dominant species competition in high-mountain grasslands. *Science of the Total Environment*, 790. <https://doi.org/10.1016/j.scitotenv.2021.147917>
- Muñoz, L., Hausner, V. H., & Monz, C. A. (2019). Advantages and Limitations of Using Mobile Apps for Protected Area Monitoring and Management. *Society and Natural Resources*, 32(4), 473–488. <https://doi.org/10.1080/08941920.2018.1544680>
- Mutanga, C. N., Vengesayi, S., Chikuta, O., Muboko, N., & Gandiwa, E. (2017). Travel motivation and tourist satisfaction with wildlife tourism experiences in Gonarezhou and Matusadona National Parks, Zimbabwe. *Journal of Outdoor Recreation and Tourism*, 20. <https://doi.org/10.1016/j.jort.2017.08.001>
- Mutiaraningrum, I., Trisnawati, H., & Rosalina, T. (2021). THE PERCEPTION OF TOUR GUIDE TRAINING: AN INSIGHT FROM THE BORDER AREA OF INDONESIA. *Journal of Tourism and Economic*, 4(1). <https://doi.org/10.36594/jtec.v4i1.107>
- Muzapu, R., & Sibanda, M. (2016). Tourism Development Strategies in Zimbabwe. *Management*. <https://doi.org/10.5923/j.mm.20160603.01>
- Navrud, S., & Mungatana, E. D. (2018). Environmental valuation in developing countries: The recreational value of wildlife viewing. In *The Stated Preference Approach to Environmental Valuation: Volume III: Applications: Benefit-Cost Analysis and Natural Resource Damage Assessment*.
- Nejmeddin, A. I. (2020). Importance of Tour Guides in Increasing the Number of Tourists at a Tourist Destination. *Polytechnic Journal of Humanities and Social Sciences*, 1(1). <https://doi.org/10.25156/ptjhss.v1n1y2020.pp18-23>
- Nguya, J., Kariuki, A., & Muthengi, S. (2021). Influence of Tour Guide Service Quality on Customer Satisfaction in Narok County, Kenya. *African Journal of Emerging Issues*, 3(1).

- Nijkamp, P., & Ratajczak, W. (2015). The Spatial Economy: A Holistic Perspective. In *Regional Science Matters* (pp. 15–26). Springer International Publishing. https://doi.org/10.1007/978-3-319-07305-7_2
- Nijkamp, P., Rose, A., & Karima, K. (2015). Regional science: What matters? which matters? In *Regional Science Matters: Studies Dedicated to Walter Isard*. https://doi.org/10.1007/978-3-319-07305-7_1
- Norkaew, T., Brown, J. L., Thitaram, C., Bansiddhi, P., Somgird, C., Punyapornwithaya, V., Punturee, K., Vongchan, P., Somboon, N., & Khonmee, J. (2019). Associations among tourist camp management, high and low tourist seasons, and welfare factors in female Asian elephants in Thailand. *PLoS ONE*, *14*(6). <https://doi.org/10.1371/journal.pone.0218579>
- Ogutu, J. O., Reid, R. S., Piepho, H. P., Hobbs, N. T., Rainy, M. E., Kruska, R. L., Worden, J. S., & Nyabenge, M. (2014). Large herbivore responses to surface water and land use in an East African savanna: Implications for conservation and human-wildlife conflicts. *Biodiversity and Conservation*, *23*(3). <https://doi.org/10.1007/s10531-013-0617-y>
- OI Pejeta Conservancy. (2023, January 5). News | OI Pejeta Conservancy. Morani Information Centre. <https://www.olpejetaconservancy.org/experience/destinations/morani-center/>
- Olson, E. C., Bowman, M. L., & Roth, R. E. (1984). Interpretation and Nonformal Environmental Education in Natural Resources Management. *The Journal of Environmental Education*, *15*(4), 6–10. <https://doi.org/10.1080/00958964.1984.9942684>
- Onchwati, J., Sommerville, H., & Brockway, N. (2010). *Sustainable tourism development in the Masai Mara National Reserve, Kenya, East Africa*. 319–330. <https://doi.org/10.2495/ST100281>
- Ordun, G. (2019). Questioning the Link between Self-Expressed Attitudes and Repurchasing Behavior. *International Journal of Research in Business and Social Science* (2147-4478). <https://doi.org/10.20525/ijrbs.v4i1.34>
- Oviedo-García, M. Á., Vega-Vázquez, M., Castellanos-Verdugo, M., & Orgaz-Agüera, F. (2019). Tourism in protected areas and the impact of servicescape on tourist satisfaction, key in sustainability. *Journal of Destination Marketing & Management*, *12*, 74–83. <https://doi.org/10.1016/j.jdmm.2019.02.005>

- Page, S. J. (1994). Tourism: Principles and practice. *Tourism Management*, 15(3), 235–237. [https://doi.org/10.1016/0261-5177\(94\)90115-5](https://doi.org/10.1016/0261-5177(94)90115-5)
- Panca, S. B. (2017). Study of the Interpreting Techniques used by the Tourist Guides in the Tourism Attractions of North Sumatra. *International Journal of English Language & Treanslation Studies*.
- Papageorgiou, K. (2001). A Combined Park Management Framework Based on Regulatory and Behavioral Strategies: Use of Visitors' Knowledge to Assess Effectiveness. *Environmental Management*, 28(1), 61–73. <https://doi.org/10.1007/s002670010207>
- Papilaya, R. L., Boli, P., & Nikijuluw, V. P. H. (2019). Carrying Capacity of Diving Tourism in Dampier Strait Marine Conservation Area - District of Raja Ampat. *IOP Conference Series: Earth and Environmental Science*, 246(1). <https://doi.org/10.1088/1755-1315/246/1/012060>
- Pearce, D. G., & Schänzel, H. A. (2013). Destination management: The tourists' perspective. *Journal of Destination Marketing and Management*. <https://doi.org/10.1016/j.jdmm.2013.06.001>
- Petracca, L. S., Frair, J. L., Bastille-Rousseau, G., Macdonald, D. W., & Loveridge, A. J. (2021). Harassment-induced changes in lion space use as a conflict mitigation tool. *Conservation Science and Practice*, 3(5). <https://doi.org/10.1111/csp2.373>
- Petric, L., & Mandic, A. (2014). VISITOR MANAGEMENT TOOLS FOR PROTECTED AREAS FOCUSED ON SUSTAINABLE TOURISM DEVELOPMENT: THE CROATIAN EXPERIENCE. *Environmental Engineering and Management Journal*, 13(6), 1483–1495. <https://doi.org/10.30638/eemj.2014.164>
- Petty, R. E., & Cacioppo, J. T. (1986). The Elaboration Likelihood Model of Persuasion. In *Advances in Experimental Social Psychology* (pp. 123–205). [https://doi.org/10.1016/S0065-2601\(08\)60214-2](https://doi.org/10.1016/S0065-2601(08)60214-2)
- Poudel, S., & Nyaupane, G. P. (2013). The Role of Interpretative Tour Guiding in Sustainable Destination Management: A Comparison between Guided and Nonguided Tourists. *Journal of Travel Research*. <https://doi.org/10.1177/0047287513478496>

- Poudel, S., & Nyaupane, G. P. (2017). Understanding Environmentally Responsible Behaviour of Ecotourists: The Reasoned Action Approach. *Tourism Planning & Development*, 14(3), 337–352. <https://doi.org/10.1080/21568316.2016.1221851>
- Powell, R. B., & Ham, S. H. (2008). Can ecotourism interpretation really lead to pro-conservation knowledge, attitudes and behaviour? Evidence from the Galapagos Islands. *Journal of Sustainable Tourism*. <https://doi.org/10.2167/jost797.0>
- Prakash, M., & Chowdhary, N. (2010). Tour guides : Roles , challenges and desired competences A review of literature. *International Journal of Hospitality & Tourism Systems*, 3(1).
- Prathumthin, S., Phongkhieo, N. T., & Nieamsup, T. (2021). Recreation conflicts in national parks and coping behaviors of park visitor. *Kasetsart Journal of Social Sciences*, 42(2). <https://doi.org/10.34044/j.kjss.2021.42.2.31>
- Presenza, A., Sheehan, L., & Ritchie, J. B. (2005). Towards a model of the roles and activities of destination management organizations. *Journal of Hospitality, Tourism and Leisure Science*.
- Raasch, U. (2004). *Interpretation as a VMS in National Parks; A case study of Jasmund National Park on the Island of Rügen, Germany*. London: Bournemouth University.
- Reisinger, Y., & Steiner, C. (2006). Reconceptualising interpretation: The role of tour guides in authentic tourism. *Current Issues in Tourism*, 9(6). <https://doi.org/10.2167/cit280.0>
- Republic of Kenya. (2013). Kenya Vision 2030: Transforming Kenya, Pathway to devolution, socio-economic development, equity and national unity. *Second Medium Term Plan, 2013 – 2017*. <https://doi.org/10.1017/CBO9781107415324.004>
- The Tourism Act, Pub. L. No. Lno 28 of 2011, 1 (2011). <https://www.tourism.go.ke/permits/>
- Republic of Kenya. (2013). *Ministry of East Africa , Commerce and Tourism: National Tourism Strategy 2013-3018*. 1–46.
- Republic of Kenya. (2018). *Kenya Tourism Agenda 2018 - 2022*. Government Printers.
- Risteskia, M., Kocevskia, J., & Arnaudov, K. (2012). Spatial Planning and Sustainable Tourism as Basis for Developing Competitive Tourist Destinations. *Procedia - Social and Behavioral Sciences*, 44, 375–386. <https://doi.org/10.1016/j.sbspro.2012.05.042>

- Roberts, M., Mearns, K., & Edwards, V. (2014). Evaluating the effectiveness of guided versus non-guided interpretation in the Kruger National Park, South Africa. *Koedoe*. <https://doi.org/10.4102/koedoe.v56i2.1160>
- Saeedi, S., El-Sheimy, N., Malek, M. R., & Neisany Samany, N. (2010). An ontology based context modelling approach for mobile touring and navigation system. *International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences - ISPRS Archives*, 38.
- Saunders, R., Weiler, B., Scherrer, P., & Zeppel, H. (2019). Best practice principles for communicating safety messages in national parks. *Journal of Outdoor Recreation and Tourism*, 25. <https://doi.org/10.1016/j.jort.2018.01.006>
- Sayyad, A. H., & Shinde, S. A. (2013). Android Mobile Based Tour Guide System using Augmented Reality. In *International Journal of Science and Research*.
- Schwartz, F., Taff, B. D., Lawhon, B., & VanderWoude, D. (2018). Mitigating Undesignated Trail Use: The Efficacy of Messaging and Direct Site Management Actions in an Urban-Proximate Open Space Context. *Environmental Management*. <https://doi.org/10.1007/s00267-018-1054-1>
- Shackley, M. (2009). Visitor Management. In *Visitor Management*. Routledge. <https://doi.org/10.4324/9780080520681>
- Sharpley, R. (2009). Tourism Development and the Environment: Beyond Sustainability? In *Tourism Development and the Environment: Beyond Sustainability?* Routledge. <https://doi.org/10.4324/9781849770255>
- Sheldon, P. J., & Fesenmaier, D. R. (2017). Design Science in Tourism: Foundations of Destination Management. In *Design Science in Tourism: Foundations of Destination Management*. https://doi.org/10.1007/978-3-319-42773-7_9
- Shidende, D. M., Kaijage, S. F., & Möbs, S. (2019). Towards enhancing tour guide professionalism in Tanzania through a tour guide portal. *African Journal of Hospitality, Tourism and Leisure*, 8(4).
- Shimokihara, S., Tanoue, T., Takeshita, K., Tokuda, K., Maruta, M., Moriuchi, T., & Tabira, T. (2021). Usefulness of navigation application for outdoor mobility guides in community-

- dwelling older adults: a preliminary study. *Disability and Rehabilitation: Assistive Technology*, 1–8. <https://doi.org/10.1080/17483107.2020.1870005>
- Shoji, Y., Yamaguchi, K., & Yamaki, K. (2008). Estimating annual visitors flow in Daisetsuzan National Park, Japan: Combining self-registration books and infrared trail traffic counters. *Journal of Forest Research*. <https://doi.org/10.1007/s10310-008-0085-5>
- Silva, V., Catry, F. X., Fernandes, P. M., Rego, F. C., & Bugalho, M. N. (2020). Trade-offs between fire hazard reduction and conservation in a Natura 2000 shrub–grassland mosaic. *Applied Vegetation Science*, 23(1). <https://doi.org/10.1111/avsc.12463>
- Sim, K.-W., Kim, B.-G., Lee, J.-H., & Pong-Sik, Y. (2018). The evaluation of effectiveness of the interpretive program at national parks. *Journal of Outdoor Recreation and Tourism*, 21, 69–75. <https://doi.org/10.1016/j.jort.2018.01.004>
- Sindiyo, D. M., & Pertet, F. N. (1984). Tourism and its impact on wildlife conservation in Kenya. *Industry & Environment*, 7(1).
- Sitati, N. W., & Ipara, H. (2012). Indigenous Ecological Knowledge of a Human-Elephant Interaction in Transmara District, Kenya: Implications for Research and Management. *Advances in Anthropology*. <https://doi.org/10.4236/aa.2012.23012>
- Smith, M. (2013). The Routledge Handbook of Cultural Tourism. In *The Routledge Handbook of Cultural Tourism*. Routledge. <https://doi.org/10.4324/9780203120958>
- Smith, S. L. J. (1988). Defining tourism a supply-side view. *Annals of Tourism Research*, 15(2), 179–190. [https://doi.org/10.1016/0160-7383\(88\)90081-3](https://doi.org/10.1016/0160-7383(88)90081-3)
- Snyder, A. I., & Tormala, Z. L. (2017). Valence asymmetries in attitude ambivalence. *Journal of Personality and Social Psychology*, 112(4), 555–576. <https://doi.org/10.1037/pspa0000075>
- Song, H., Kim, J. H., & Wang, Y. (2021). Understanding the causes of negative tourism experiences. *Current Issues in Tourism*, 24(3). <https://doi.org/10.1080/13683500.2020.1711711>
- Sterry, P. (2000). Interpreting cultural heritage: the challenge for African initiatives. In J. Akama & P. Sterry (Eds.), *Cultural tourism in Africa: strategies for the new millennium* (pp. 185–184). Association for Tourism and Leisure Education. [http://www.atlas-euro.org/pages/pdf/Cultural tourism in Africa Deel 1.pdf](http://www.atlas-euro.org/pages/pdf/Cultural%20tourism%20in%20Africa%20Deel%201.pdf)

- Stough, R. R., Kourtit, K., Nijkamp, P., & Blien, U. (2018). Geographic Labor Markets, Aging and Migration: A Panoramic Perspective. In *Advances in Spatial Science* (pp. 1–16). https://doi.org/10.1007/978-3-319-68563-2_1
- Sugimoto, K., Ota, K., & Suzuki, S. (2019). Visitor Mobility and Spatial Structure in a Local Urban Tourism Destination: GPS Tracking and Network analysis. *Sustainability*, *11*(3), 919. <https://doi.org/10.3390/su11030919>
- Švajda, J., Masný, M., Koróny, S., Mezei, A., Machar, I., & Taczanowska, K. (2018). Visitor profiling using characteristics of socio-demographic and spatial behavior as tools to support the management of protected mountain areas. *Geografie*, *123*(4), 461–478. <https://doi.org/10.37040/geografie2018123040461>
- Svobodova, K., Monteiro, L., Vojar, J., & Gdulova, K. (2019). Can trail characteristics influence visitor numbers in natural protected areas? A quantitative approach to trail choice assessment. *Environmental and Socio-Economic Studies*, *7*(2). <https://doi.org/10.2478/environ-2019-0008>
- Taherdoost, H. (2016). Sampling Methods in Research Methodology; How to Choose a Sampling Technique for Research. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3205035>
- Timothy, D. J., & Boyd, S. W. (2014). *Tourism and Trails*. Multilingual Matters. <https://doi.org/10.21832/9781845414795>
- Tonon, G. (2019). Integrated Methods in Research. In P. Liamputtong (Ed.), *Handbook of Research Methods in Health Social Sciences* (pp. 681–694). Springer Singapore. https://doi.org/10.1007/978-981-10-5251-4_96
- Topler, J. P., Zubanov, V., Gorenak, M., & Knežević, M. (2017). Communication skills in the tourism sector - The role of Tour Guides in presenting attractions. *Tourismos*, *12*(1).
- United Nations World Tourism Organization (UNWTO). (2016). Tourism -key to development, prosperity and well-being International tourism in 2016 – Key trends and outlook. *UNWTO Tourism Highlights*. <https://doi.org/10.18111/9789284419029>
- UNWTO. (2015). Tourism In Africa: A Tool for Development. *UNWTO, Affiliate Members Regional Report, 4* (Tourism in Africa: A Tool for Development), 2.

- UNWTO. (2017). *UNWTO Tourism Highlights: 2017 Edition*. World Tourism Organization (UNWTO). <https://doi.org/10.18111/9789284419029>
- UNWTO. (2018). UNWTO Annual Report 2017. In *UNWTO Annual Report 2017*. World Tourism Organization (UNWTO). <https://doi.org/10.18111/9789284419807>
- UNWTO. (2018). Continued healthy growth in international tourism in the first nine months of 2018. *World Tourism Barometer*.
- Valkó, O., & Deák, B. (2021). Increasing the potential of prescribed burning for the biodiversity conservation of European grasslands. In *Current Opinion in Environmental Science and Health* (Vol. 22). <https://doi.org/10.1016/j.coesh.2021.100268>
- Valkó, O., Deák, B., Magura, T., Török, P., Kelemen, A., Tóth, K., Horváth, R., Nagy, D. D., Debnár, Z., Zsigrai, G., Kapocsi, I., & Tóthmérész, B. (2016). Supporting biodiversity by prescribed burning in grasslands — A multi-taxa approach. *Science of the Total Environment*, 572. <https://doi.org/10.1016/j.scitotenv.2016.01.184>
- Van der Donk, M. (2014). *Framework for a Visitor Management Plan*. Visitor Management PAN Parks. http://www.panparks.org/sites/default/files/docs/publications-resources/asnatureintended_large_0.pdf
- Van der Merwe, P., Saayman, M., & Botha, E. (2020). Interpretation needs and preferences of visitors to kgalagadi transfrontier park. *Koedoe*, 62(1). <https://doi.org/10.4102/koedoe.v62i1.1613>
- Vengesayi, S., Mavondo, F. T., & Reisinger, Y. (2009). Tourism destination attractiveness: Attractions, facilities, and people as predictors. *Tourism Analysis*. <https://doi.org/10.3727/108354209X12597959359211>
- Verbos, R. I., Zajchowski, C. A. B., Brownlee, M. T. J., & Skibins, J. C. (2018). 'I'd like to be just a bit closer': wildlife viewing proximity preferences at Denali National Park & Preserve. *Journal of Ecotourism*, 17(4). <https://doi.org/10.1080/14724049.2017.1410551>
- Vij, M., & Upadhyaya, A. (2021). Systems approach to design and development of a tourist guide training program: a case study of Sharjah tourism. *Tourism Recreation Research*, 46(3). <https://doi.org/10.1080/02508281.2020.1804735>

- Walker, K., & Weiler, B. (2017). A new model for guide training and transformative outcomes: a case study in sustainable marine-wildlife ecotourism. *Journal of Ecotourism*, 16(3). <https://doi.org/10.1080/14724049.2016.1245736>
- Wall, G. (2018). Beyond sustainable development. *Tourism Recreation Research*, 43(3), 390–399. <https://doi.org/10.1080/02508281.2018.1475880>
- Wang, W. C. (2015). Visitor perception, interpretation needs, and satisfaction of eco-tourism: the case of Taijiang National Park, Taiwan. *Enlightening Tourism: A Pathmaking Journal*. <https://doi.org/10.33776/et.v5i2.2719>
- Weber, A., Kalema-Zikusoka, G., & Stevens, N. J. (2020). Lack of Rule-Adherence During Mountain Gorilla Tourism Encounters in Bwindi Impenetrable National Park, Uganda, Places Gorillas at Risk From Human Disease. *Frontiers in Public Health*, 8. <https://doi.org/10.3389/fpubh.2020.00001>
- Weiler, B., & Walker, K. (2014). Enhancing the visitor experience: Reconceptualising the tour guide's communicative role. *Journal of Hospitality and Tourism Management*, 21, 90–99. <https://doi.org/10.1016/j.jhtm.2014.08.001>
- Whitburn, J., Linklater, W., & Abrahamse, W. (2020). Meta-analysis of human connection to nature and proenvironmental behavior. *Conservation Biology*, 34(1), 180–193. <https://doi.org/10.1111/cobi.13381>
- Wolf, I. D., Croft, D. B., & Green, R. J. (2019). Nature conservation and nature-based tourism: A paradox? In *Environments* - MDPI (Vol. 6, Issue 9). <https://doi.org/10.3390/environments6090104>
- WorldBank. (2018). Narok County. Narok County Government, Crime and Violence Assessment, 24. <http://www.narok.go.ke/about-narok>
- Xu, F., & Fox, D. (2014). Modelling attitudes to nature, tourism and sustainable development in national parks: A survey of visitors in China and the UK. *Tourism Management*. <https://doi.org/10.1016/j.tourman.2014.03.005>
- Yang, S., & Hsu, C. (2016). A location-based services and Google maps-based information master system for tour guiding. *Computers & Electrical Engineering*, 54, 87–105. <https://doi.org/10.1016/j.compeleceng.2015.11.020>

- Yang, T. H., Huang, I. C., Huang, E. L., & Huang, L. P. (2014). A comparison of visitors' characteristics, traveling motivations, recreational experiences, and attitudes toward recreational carrying-capacity controls between peak and off-peak seasons. *Taiwan Journal of Forest Science*, 29(1).
- Zelenka, J., & Kacetl, J. (2013). Visitor management in protected areas. *Czech Journal of Tourism*, 2(1), 5–18. <https://doi.org/10.2478/cjot-2013-0001>
- Zhai, Y., & Baran, P. K. (2019). Trail configurational attributes and visitors' spatial distribution in natural recreation area. 12th International Space Syntax Symposium, SSS 2019.
- Zuliskandar, R. (2017). Heritage Tourism in Malaysia: Potential & Challenges. In *The Social Sciences*, , 12(3), 431-440.

APPENDICES

APPENDIX I: QUESTIONNAIRE FOR TOURISTS

Dear Sir/Madam

I am researching '**Nature Interpretation and Behaviour Regulation in Wildlife Tourism Destinations**,' and I request you to participate in the study by responding to the questions below. The information provided will be treated confidential and will be used for academic purposes only. Thank you in advance for your participation.

Yours Faithfully,

Leonard Juma

Email: Leonard.juma@dkut.ac.ke

Cell: +254 722 605 083

SECTION A:

1. **Nationality:** Kenyan Citizen Resident foreigner Non-Resident
2. **Gender:** (Male / Female/ Other).....
3. **Age (tick/check one);** below 24 years , 25-40 , 41-65 , 66 & above
4. **Highest level of education (Tick where applicable)**
 University , College Secondary Primary

5. The main purpose of visiting Masai Mara National Reserve? *(Choose/Tick One)*

No	Purpose	Tick	No	Purpose	Tick
a	Work-related - Tour guide		c	Tourist on Holiday/ Vacation	
b	Work-related - Others		d	Education and Research	

6. Type of vehicle used for wildlife viewing in Maasai Mara National Reserve? *(Choose/Tick One)*

a	Self-drive tourist with an ordinary vehicle	
b	Self-drive tourist with a tour equipped vehicle	
c	Driver guide with a company tour equipped vehicle	
d	Freelance local guide with a tour equipped vehicle	

SECTION B:

7. What nature interpretative services did you witness/ encounter in Maasai Mara National Reserve *(tick as many as applicable)*

a	Tour guiding		c	Display boards & directional signage	
b	Visitor codes/ dos' and do nots		d	Visitor information centres	

8. Using the scale provided, respond to the statements about tour guides in Maasai Mara National Reserve; **(use the scale; Strongly Disagree (SD), Disagree (D), Neither Agree nor Disagree (NAD), Agree (A) and, Strongly Agree (SA).**

a	communicate reserve do's and do nots	SD	D	NAD	A	SA
b	have a good understanding of wildlife	SD	D	NAD	A	SA
c	have good tour guiding skills	SD	D	NAD	A	SA
d	provide enlightening nature interpretation	SD	D	NAD	A	SA
e	require regular interpretational training and sensitization	SD	D	NAD	A	SA

9. Would you recommend a new tour guiding curriculum to train tour guides in Maasai Mara National Reserve?

- (i) YES (ii) NO (iii) NOT SURE

10. If yes, what topic areas should be included in the new curriculum to be designed

.....
.....

11. Respond to the statements about VISITOR CODES, DISPLAY BOARDS, AND DIRECTIONAL SIGNAGE in MMNR; (use the scale; *Strongly Disagree (SD)*, *Disagree (D)*, *Neither Agree nor Disagree (NAD)*, *Agree (A)* and, *Strongly Agree (SA)*).

a	They are too many	SD	D	NAD	A	SA
b	They are strategically located	SD	D	NAD	A	SA
c	They are of appropriate size and visible	SD	D	NAD	A	SA
d	They are easy to read and understand	SD	D	NAD	A	SA
e	They are observed by tour guides and tourists	SD	D	NAD	A	SA
f	They are communicated to tourists by guides	SD	D	NAD	A	SA

12. Why will tourists and tour drivers not follow visitor codes and directional signage in Masai Mara National Reserve? (tick as appropriate) (*tick as many as applicable*)

a	Pressure from tourists to get better view and photograph	
b	Desire to get the tourists a memorable experience	
c	There is NO strict enforcement of the game drive codes	
d	Tipping and other inducements from tourists	
e	To get value for the entry fee paid	
f	Ignorance of the consequences of flouting the visitor codes	

SECTION D:

13. On average, around what time do most morning game drives START? (**choose one**)

a) 6:00-7:00 AM	b) 7:01 – 8:00AM	c) 8:01- 9:00AM	d) After 9:01 AM
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14. On average, around what time do most Afternoon game drives START? (**choose one**)

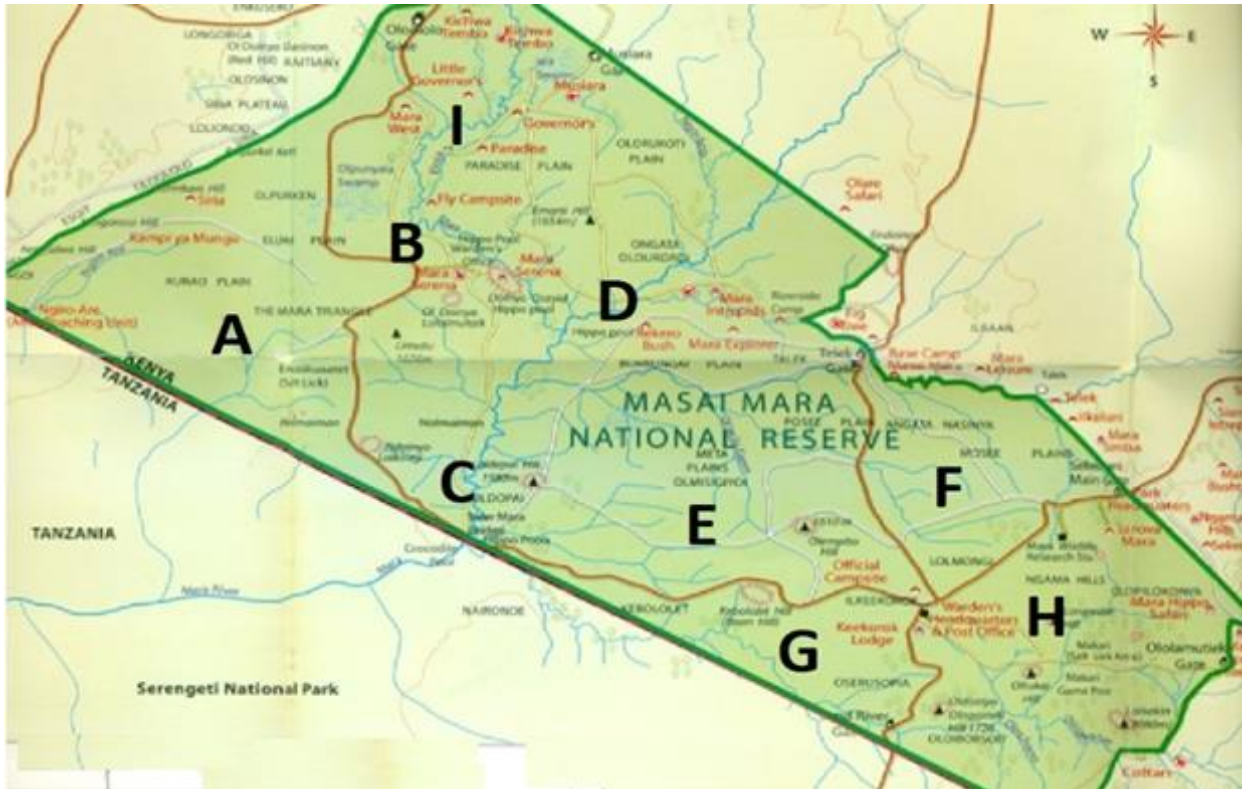
a) 3:00PM	b) 4:00PM	c) 5:00PM	d) Full day game drive
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15. What was the average length of your game drives in hours per day?.....

16. How many vehicles on average come together at a wildlife sighting? **(choose one)**

a) 1 to 2 vehicles	b) 3 to 5 vehicles	c) 6 or more vehicles
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17. Which of the following areas have you visited in MMNR **(choose as many as applicable)**



A	Lower Mara triangle and Tanzania border	F	Mara Simba to Talek Gate region
B	Central Mara triangle -Serena Area	G	Keekerok Lodge to Sandriver gate region
C	Mara Bridge area and border viewpoint	H	Keekerok airstrip- Mara Hippo - Sarova region
D	Mara Intrepid-Explorer-Rekerobush	I	Upper Mara triangle- Governor's camps region
E	Meta plains region		Other.....

18.1. Apart from nature interpretation which of the following traditional visitor management strategies are commonly used in Maasai Mara National Reserve?

a	Wildlife trail closure	c	Penalties and fines for defaulters
b	Ranger vehicle patrols	d	Limiting access

18.2. Would the experience have been different if there were NO tour guide, directional signage, visitor codes, or guide maps?

(i) YES (ii) NO (iii) MAYBE

18.3. What are the strong points of nature interpretation in MMNR?

.....

18.4. What are the weak points of nature interpretation in Maasai Mara National Reserve?

.....

.....

SECTION E:

19. Respond to the following statements about the behaviour exhibited by wildlife viewers in Maasai Mara National Reserve; (use the scale; **Strongly Disagree (SD)**, **Disagree (D)**, **Neither Agree nor Disagree (NAD)**, **Agree (A)** and, **Strongly Agree (SA)**)

a	Become more enlightened about nature and wildlife	SD	D	NAD	A	SA
b	act responsibly not to impact attractions negatively.	SD	D	NAD	A	SA
c	Observe visitor codes and directional signage	SD	D	NAD	A	SA
d	Supports nature interpretation efforts	SD	D	NAD	A	SA
e	financially support conservation areas	SD	D	NAD	A	SA
f	Visitors get a satisfying experience	SD	D	NAD	A	SA
g	Other (specify).....	SD	D	NAD	A	SA

Thank you for the responses

APPENDIX II: QUESTIONNAIRE FOR TOUR DRIVER GUIDES

Dear Sir/Madam

I am researching '**Nature Interpretation and Behaviour Regulation in Wildlife Tourism Destinations**,' I request you to participate in the study by responding to the questions below. The information provided will be treated confidential and will be used for academic purposes only. Thank you in advance for your participation.

Yours Faithfully,

Leonard Juma

Email: leonard.juma@dkut.ac.ke

Cell: +254 722 605 083

SECTION A:

18. Nationality: Kenyan Citizen Resident foreigner Non-Resident

19. Gender: (Male / Female/ Other).....

20. Age (tick/check one); below 24 years , 25-40 , 41-65 , 66 & above

21. What is your highest level of education? (Tick appropriately)

University , College Secondary Primary

22. The main purpose of visiting Masai Mara National Reserve? **(Choose/Tick One)**

No	Purpose	Tick	No	Purpose	Tick
a	Work-related - Tour guide		c	Tourist on Holiday/ Vacation	
b	Work-related - Others		d	Education and Research	

23. Type of vehicle used for wildlife viewing in Maasai Mara National Reserve? **(Choose/Tick One)**

a	Self-drive tourist with an ordinary vehicle	
b	Self-drive tourist with a tour equipped vehicle	
c	Driver guide with a company tour equipped vehicle	
d	Freelance local guide with a tour equipped vehicle	

SECTION B:

24. (i) How many TRIPS on a monthly average do you make into Masai Mara National Reserve.

1 2 3 4 5 6 7 8 9 10

(ii) Do you have a valid Tourism Regulatory Authority tour guiding license? **(choose/tick one);**

(a) YES (b) NO

(ii) If the answer is 'NO' in 7 (ii) above, why? (select 'Not applicable' ONLY if your answer was 'YES' in question 7 (i) above)

a	I do not have the relevant professional qualifications	Yes	No
b	I have not had time to renew it	Yes	No

c	It is difficult to get	Yes	No
d	It is not necessary	Yes	No
e	Not applicable	Yes	No

SECTION C:

(ii) What nature interpretative services did you witness/ encounter in Maasai Mara National Reserve (*tick as appropriate*)

a	Tour guiding	c	Display boards & directional signage
b	Visitor codes/ dos' and do nots	d	Visitor information centres

(iii) Using the scale provided, respond to the statements about tour guides in Maasai Mara National Reserve; (use the scale; *Strongly Disagree (SD), Disagree (D), Neither Agree nor Disagree (NAD), Agree (A) and, Strongly Agree (SA).*)

a	communicate reserve do's and do nots	SD	D	NAD	A	SA
b	have a good understanding of wildlife	SD	D	NAD	A	SA
c	have good tour guiding skills	SD	D	NAD	A	SA
d	provide enlightening nature interpretation	SD	D	NAD	A	SA
e	require regular training and sensitization	SD	D	NAD	A	SA

10.1. Would you recommend a new tour guiding curriculum to train tour guides in Maasai Mara National Reserve? (i) YES (ii) NO (iii) NOT SURE

10.2. If yes, what topic areas should be included in the new curriculum to be designed

.....

10.3. Which institution did you train as a tour guide?.....

10.4. What level of tour guide training was it? (i) CERTIFICATE (ii) DIPLOMA, (iii) DEGREE (iv) NONE

10.5. What were the strong points of the training?

.....

10.6. What were the weaknesses of the training?.....

11. Respond to the statements about VISITOR CODES, DISPLAY BOARDS, AND DIRECTIONAL SIGNAGE in MMNR; (use the scale; *Strongly Disagree (SD), Disagree (D), Neither Agree nor Disagree (NAD), Agree (A) and, Strongly Agree (SA).*)

a	They are too many	SD	D	NAD	A	SA
b	They are strategically located	SD	D	NAD	A	SA
c	They are of appropriate size and visible	SD	D	NAD	A	SA
d	They are easy to read and understand	SD	D	NAD	A	SA

e	They are observed by tour guides and tourists	SD	D	NAD	A	SA
f	They are communicated to tourists by guides	SD	D	NAD	A	SA

12. Why will tourists and tour drivers NOT follow visitor codes and directional signage in Masai Mara National Reserve? (tick as appropriate) (**tick as many as applicable**)

a	Pressure from tourists to get better view and photograph	
b	Desire to get the tourists a memorable experience	
c	There is NO strict enforcement of the game drive codes	
d	Tipping and other inducements from tourists	
e	To get value for the entry fee paid	
f	Ignorance of the consequences of flouting the visitor codes	

SECTION D:

13. On average, around what time do most morning game drives START? (**choose one**)

e) 6:00-7:00 AM	f) 7:01 – 8:00AM	g) 8:01- 9:00AM	h) After 9:01 AM
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14. On average, around what time do most Afternoon game drives START? (**choose one**)

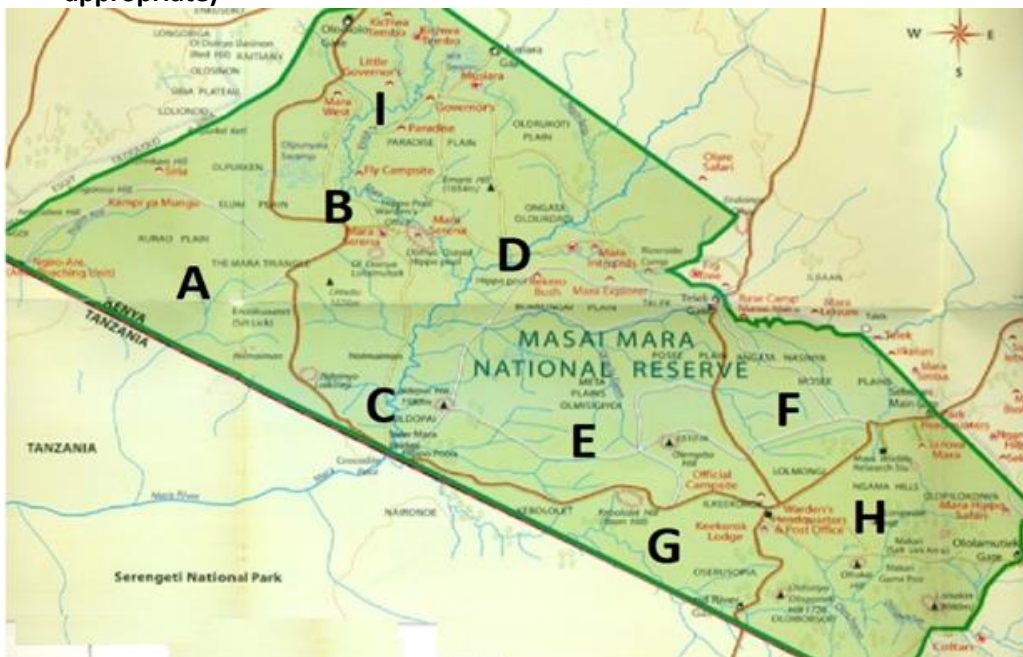
e) 3:00PM	f) 4:00PM	g) 5:00PM	h) Full day game drive
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15. What was the average length of your game drives in hours per day?.....

16. How many vehicles on average come together at a wildlife sighting? (**choose one**)

d) 1 to 2 vehicles	e) 3 to 5 vehicles	f) 6 or more vehicles
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17. Which of the following areas have you visited or plan to visit during the stay (**circle as many as appropriate**)



A	Lower Mara triangle and Tanzania boarder	F	Mara Simba to Talek Gate region
B	Central Mara triangle -Serena Area	G	Keekerok Lodge to Sandriver gate region
C	Mara Bridge area and boarder viewpoint	H	Keekerok airstrip- Mara Hippo - Sarova region
D	Mara intrepids-Explorer-Rekero bush	I	Upper Mara triangle- Governor's camps region
E	Meta plains region	J	Other...

18.1. Apart from nature interpretation which of the following traditional visitor management strategies are commonly used in Maasai Mara National Reserve?

a	Wildlife trail closure	c	Penalties and fines for defaulters
b	Ranger vehicle patrols	d	Limiting access

18.2 Would the experience have been different if there were NO tour guide, directional signage, visitor codes, or guide maps?

(i) YES (ii) NO (iii) MAYBE

18.3. What are the strong points of nature interpretation in MMNR?

.....

18.4. What are the weak points of nature interpretation in Maasai Mara National Reserve:

.....

SECTION E:

20. Respond to the following statements about the behaviour exhibited by wildlife viewers in Maasai Mara National Reserve; (use the scale; **Strongly Disagree (SD), Disagree (D), Neither Agree or Disagree (NAD), Agree (A) and, Strongly Agree (SA)**)

a	Become more enlightened about nature and wildlife	SD	D	NAD	A	SA
b	act responsibly not to impact attractions negatively.	SD	D	NAD	A	SA
c	Observe visitor codes and directional signage	SD	D	NAD	A	SA
d	Supports nature interpretation efforts	SD	D	NAD	A	SA
e	financially support conservation areas	SD	D	NAD	A	SA
f	Visitors get a satisfying experience	SD	D	NAD	A	SA
g	Other (specify)...	SD	D	NAD	A	SA

Thank you for the responses

APPENDIX III: INTERVIEW GUIDE

Dear Sir/Madam

I am researching 'Nature Interpretation and Behaviour Regulation in Wildlife Tourism Destinations,' I request you to participate in the study by responding to the questions below. The information provided will be treated confidential and will be used for academic purposes only. Thank you in advance for your participation.

Yours Faithfully,

Leanard Juma

Email: leanard.juma@dkut.ac.ke

Cell: +254 722 605 083

Q1. What comments can you make on the following demographics of wildlife viewers' into MMNR

(a) Nationality, (b) gender (c) age (d) highest level of education

Q5. What comments can you make on the purpose of visiting wildlife viewers into MMNR

Q6. What types of vehicles are mainly used for wildlife viewing in MMNR?

Q7. What nature interpretative services are used in MMNR?

Q8. What comments can you make on the competencies and delivery of tour guides in MMNR?

Q9. Would you recommend a new tour guiding curriculum to train tour guides in Maasai Mara National Reserve?

Q10. If 'YES' or 'MAYBE' in 9.1 above, what topic areas should the new curriculum include

Q11. What comments can you make on the visitor codes, display boards, and directional signage in MMNR?

Q12. Why will tourists and tour drivers not follow visitor codes and directional signage in Masai Mara National Reserve?

Q13. On average, around what time do most morning game drives /wildlife viewing START?

Q14. On average, around what time do most Afternoon game drives START?

Q15. What was the average length of game drives in hours per day?

Q16. How many vehicles on average come together at a wildlife sighting?

Q17. Which of the following areas visited in MMNR

18.1. Apart from nature interpretation, which traditional visitor management strategies are commonly used in Maasai Mara National Reserve?

18.2. Would the experience have been different if there were NO tour guide, directional signage, visitor codes, or guide maps?

Q18.3. What are the strong points of nature interpretation in MMNR?



Q18.4. What are the weak points of nature interpretation in MMNR?

Q19. What is the effect of NI on wildlife viewers' behaviour in Maasai Mara National Reserve?

APPENDIX IV: OBSERVATION CHECKLIST; TOURIST VEHICLE TRACKING

	Vehicle tracking NO	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>
No	Observation item / Date												
1	Time												
2	Wildlife viewing Zone												
3	Number (No.) of vehicles in the group												
4	No. of vehicles at a wildlife sighting												
5	Over-crowding at a wildlife sighting	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
6	Est. distance from big cats												
7	Est. distance from big herbivores												
8	Est. distance from Small wildlife												
9	Duration at a wildlife sighting												
10	Driver respects other reserve users	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
11	Off-road driving in restricted areas	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
12	Wildlife viewers Litters	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
13	Harasses animals	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
14	Hooting/ making noise	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
15	Observes speed limit	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
KEY: Big cats: Lion, leopard, Cheetah, Hyena, etc		Big herbivores: Elephant, Buffalo, Giraffes, Rhino, Zebra, Hippos, Gnu, etc						Small wildlife: gazelles, jackal, birds, etc					


APPENDIX-V: RESEARCH PERMIT

REPUBLIC OF KENYA
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Ref No: **821613** Date of Issue: **18/December/2019**

RESEARCH LICENSE




This is to Certify that Mr. Leonard Juma of Stent Istva, In University, has been licensed to conduct research in Nakuru, Narok on the topic: NATURE INTERPRETATION AND BEHAVIOR REGULATION AMONG VISITORS IN ATTRACTION SITES; THE CASE OF MA-SAI MARA NATIONAL RESERVE, KENYA. IMPACT OF GEOTHERMAL POWER-GENERATION ACTIVITIES ON THE SUSTAINABILITY OF HELLS' GATE NATIONAL PARK AS A TOURIST ATTRACTION IN KENYA for the period ending : 18/December/2020.

License No: **NAC OSTI/P19/3240**

Applicant Identification Number: **821613**

Director General
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Verification QR Code



NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

APPENDIX-VI: NAROK COUNTY RESEARCH AUTHORIZATION



NAROK COUNTY GOVERNMENT DEPARTMENT OF TOURISM AND WILDLIFE

County Headquarters
Mau-Narok Road, Narok Town
P.O Box 898 -20500
Narok, Kenya.

Tel: 020 268 8929/03
Email: tourism@narok.go.ke
Website: www.narok.go.ke

When Replying Quote:

21st January 2020

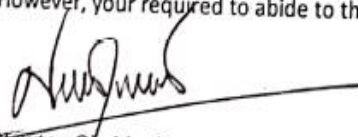
TO,
Leanard Otworu Juma
Szetnt Istvan Egyetem University
Pater Karoly Ut 1.
2100 Godollo,
Mobile: 0722-605 083

RE: PERMISSION TO CONDUCT RESEARCH AT THE MAASAI MARA.

We acknowledge receipt of your letter dated 15th January 2020 requesting to conduct an academic research on a project titled: **Nature Interpretation and Tourism Behaviour Regulation** in Maasai Mara National Reserve, Kenya.

We are pleased to inform you that your request has been accepted and that you have been granted permission to conduct the study. Report to the senior warden for guidelines.

However, you are required to abide by the park rules and regulations.


Newton Oje Mpaima.

CHIEF OFFICER –TOURISM AND WILDLIFE

Cc-CEC –Tourism and wildlife

Chief park warden

APPENDIX-VII: THE GREATER MARA VISITOR CODE



COUNTY GOVERNMENT OF NAROK Maasai Mara National Reserve Rules and Regulations

- Respect the privacy of the wildlife, this is their habitat
- Stay in your vehicle at all times, except at designated picnic sites
- No alighting from vehicles at river crossing points
- When viewing wildlife, keep to a minimum distance of 25 meters and pull to the side of the road so as to allow others to pass
- When there are more than five vehicles waiting to see an animal, viewing time is restricted to 10 minutes. Vehicles waiting to see the sighting must wait at a distance of 100 meters.
- Do not make a circle around the animal, it needs to check environment for a potential danger
- Do not chase, follow or harass animals
- Turn off the engine and radio when stopped to observe animals. Keep quiet while watching animals - noise disturbs the wildlife and may irritate your fellow visitors
- Do not make any noise, accelerate or start/stop an engine to attract animal's attention, respect privacy of the animals
- Do not feed the animals, it upsets their diet and leads to human dependence
- Do not use flash/external light/headlights while photographing/filming animals, it can affect their vision
- Do not separate any baby animal from the mother by driving. If you hear group members (mother/baby/coalition mates etc) calling being separated, immediately stop driving and switch off the engine and radio. Noise confuses animals and prevents finding each other if lost
- Do not drive whenever animals are hunting. Perpetration will be equated to the animal harassment
- Animals have a right of way and right to eat. Blocking any walking wild predator and approaching it before it has started eating after successful hunt is harassment and punishable
- Wild cats (cheetah, leopard etc.) On/in the vehicle are strictly prohibited. Keep a distance from the cats (with cubs or without) of 25 meters, and under no circumstances do not approach cats moving towards your car, as it may encourage them climbing a vehicle. Abusing this rule will be equated to the animal harassment
- Do not stand/sit on the rooftop or bonnet of vehicles while on game drive or at any wildlife sighting
- Keep below the maximum speed limit 50 km/h on main roads and 30 km/h on game viewing roads
- Do not drive off-road, this severely damages the habitat. Keep to granted roads and cut grass tracks
- Do not smoke near animals, leave for 100 m
- No pets are allowed into the park
- Leave no litter and never leave fires unattended or discard burning objects

- Ensure that you get correct receipts at KATO Office or at the gate and produce these to the park officials on demand
- Resident vehicles should have valid annual park licenses displayed
- Use only designated entry/exit gates
- Visitors are allowed in the park between 6.00 am and 6.45 pm. Night game driving is not allowed
- Do not cross Tanzanian border
- Filming and photography must follow the due process and all fee attached must be settle to the Narok County Government
- Do not use drones and remote recording devices
- Entry to the Park is at your own risk

Breaking any of the above rules, the Narok County Government Rangers have the legal right to:

- Impose an on-the-spot a fine
- Have a vehicle and/or people removed from the park immediately
- Have a vehicle and/or people banned from the park

Violation Category Penalties (in KES)

- Non-payment of park fees – 20,000 per vehicle, driver – 20,000
- Repeat default – 20,000 per vehicle, driver – 50,000
- Possession of invalid tickets – 20,000 per vehicle
- Off-road driving –15,000 per vehicle and ban for repeat offenders
- Animal disturbance/harassment –10,000 per vehicle
- Littering inside the park –3,000 per person
- Late and early game drive default fee – 10,000 per vehicle

Park authorities provide:

- Security guided tours for 6 hours – KES 3,000 per vehicle
- Security guided tours for less than 6 hours – KES 1,500 per vehicle
- Full night camp security – KES 5,000 per night

For any enquiries and complain, please contact the Senior Park Warden’s office at Sekenani park headquarters. In case of any question, please contact the sector Warden near you or the park management team

Enjoy your stay in Maasai Mara National Reserve; your satisfaction is our happiness. Welcome again!

APPENDIX-VIII: MARA TRIANGLE VISITOR CODE



Mara Triangle Park Rules

1. Please keep to the speed limits : 50km/hr on graded roads, 30km/hr all others.
2. Always slow down for animals.
3. Do not off-road in High Use & River Zones.
4. Keep to graded roads and cut tracks in above zones.
5. Off-roading in Low Use Zone is allowed to view big cats.
6. Always stay more than 25 meters away from animals.
7. Please, no shouting, clapping nor cheering.
8. Do not sit nor stand on vehicle's roof at any time.
9. No more than 5 vehicles at wildlife sightings. *
10. No alighting from vehicles at river crossing points. **
11. Do not cross Tanzanian border.
12. Do not chase, follow or harass animals.
13. No littering.
14. Leave park or be in camp/lodge by 7:00pm.

* When there are more than five vehicles waiting to see an animal, viewing time is restricted to 10 minutes. Vehicles waiting to see the sighting must wait at a distance of 100 metres.

** During the migration, never block a river crossing by parking too close to the crossing point. Also make sure you do not drive through animal herds.

Please respect the rules and our rangers, who are there to ensure the protection of the wildlife and the environment. If you break any of the above rules, Rangers have the legal right to:

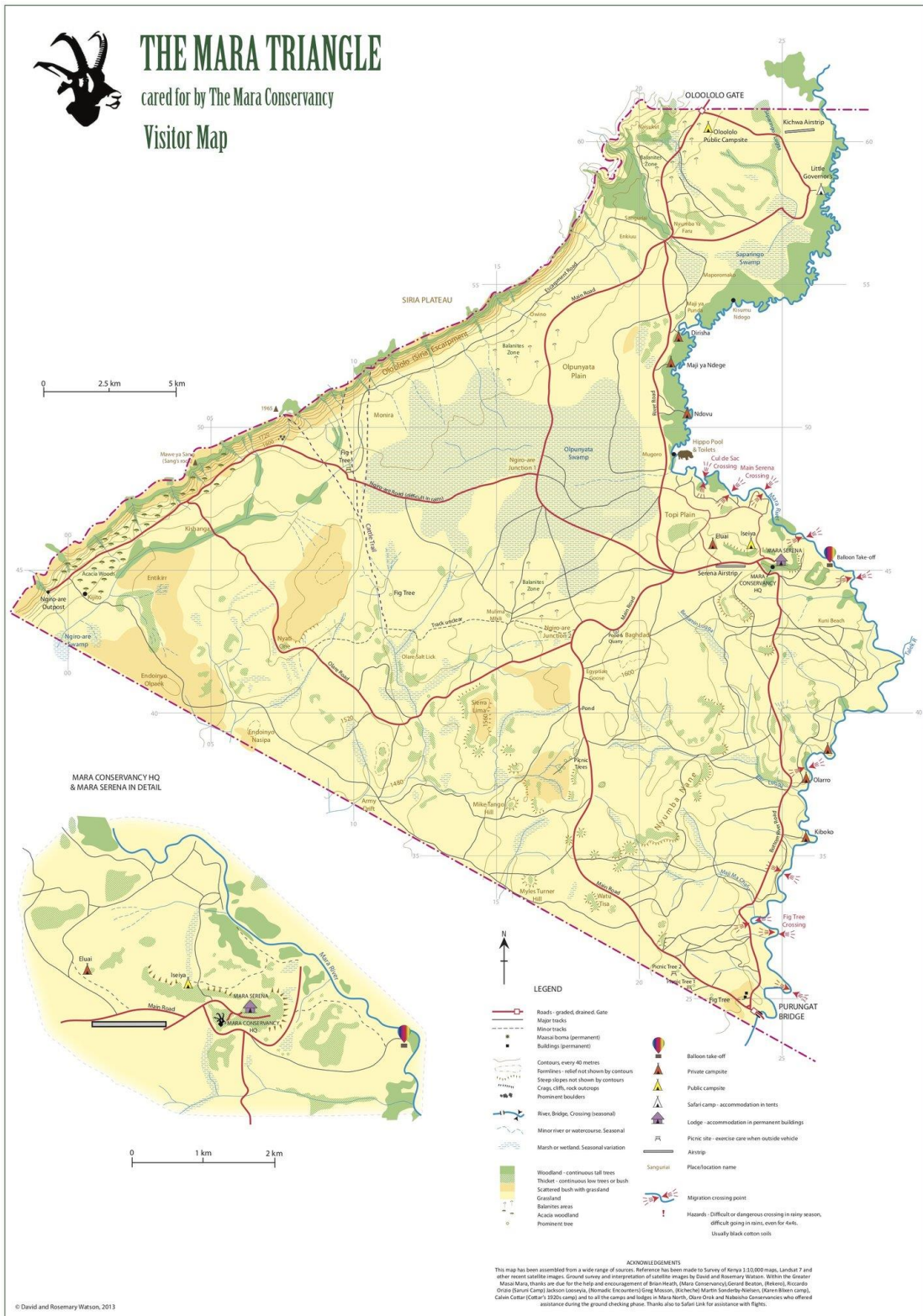
- Impose an on-the-spot fine of KSh 10,000
- Have a vehicle and/or people removed from the park immediately
- Have a vehicle and/or people banned from the park

Help us to protect the park: If you see park rules being broken, please take a photograph of the incident (preferably with vehicle's number plate) and send to mara@maratriangle.org

Mara Conservancy

Ver. English

APPENDIX-IX: THE MARA TRIANGLE



APPENDIX-X: MASAI MARA NATIONAL RESERVE WILDLIFE CHECKLIST

Masai Mara National Reserve Mammal Checklist

Warthog	Bush Hyrax	Side-striped Jackal
Masai Giraffe	Aardvark	African Wild Dog
Common Hippopotamus	Cape Pangolin	Striped Polecat
Kirk's Dik-Dik	Common Genet	Honey Badger / Ratel
Klipspringer	Slender Mongoose	Lesser Bushbaby
Oribi	Egyptian Mongoose	Syke's Monkey / Blue Monkey
Thomson's Gazelle	Marsh Mongoose	Copper-tailed Monkey / Red-tailed Monkey
Grant's Gazelle	White-tailed Mongoose	Vervet Monkey
Common Reedbuck	Dwarf Mongoose	Olive Baboon
Defassa Waterbuck	Banded Mongoose	Straw-colored Fruit Bat
Coke's Hartebeest	Spotted Hyena	Yellow-winged Bat
Topi	Aardwolf	African Har
White-bearded Wildebeest	African Wildcat	Kenyan Tree Squirrel
Impala	Serval cat	Spring hare
Bushbuck	Caracal	Southern African Crested Porcupine
Common Eland	Leopard	Four-striped Grass Mouse
African Buffalo	Lion	Savanna Giant Pouched Rat
Black Rhinoceros	Cheetah	Greater Cane Rat
Common Zebra	Bat-eared Fox	
African Elephant	Black-backed Jackal	

Maasai Mara National Reserve Bird Checklist

Common Ostrich	Purple Heron	White-faced Whistling-Duck
Little Grebe	Goliath Heron	Spur-winged Goose
Long-tailed (Reed) Cormorant	Black-headed Heron	Egyptian Goose
African Darter	White Stork	Comb (Knob-billed) Duck
Little Bittern	Black Stork	Northern Pintail
Dwarf Bittern	Abdim's (White Bellied) Stork	Red-billed Teal
Black-crowned Night-Heron	Woolly-necked Stork	Hottentot Teal
Cattle Egret	Saddle-billed Stork	Secretarybird
Little Egret	Marabou Stork	African White-backed
Common Squacco	African Openbill Stork	Rüppell's Vulture
Rufous-bellied Heron	Yellow-billed Stork	Lappet-faced Vulture
Striated (Green-backed) Heron	Sacred Ibis	White-headed Vulture
Intermediate (Yellow-billed) Egret	Hadada Ibis	Egyptian Vulture
Great (White) Egret	Glossy Ibis	Hooded Vulture
Grey Heron	African Spoonbill	African Fish-Eagle

Lesser Spotted Eagle	Common Buttonquail	Common Redshank
Tawny Eagle	Coqui Francolin	Marsh Sandpiper
Steppe Eagle	Shelley's Francolin	Common Greenshank
Wahlberg's Eagle	Scaly Francolin	Green Sandpiper
Verreaux's Eagle	Red-necked Spurfowl	Wood Sandpiper
African Hawk-Eagle	Crested Francolin	Common Sandpiper
Booted Eagle	Helmeted Guineafowl	Gull-billed Tern
Long-crested Eagle	African Rail	White-winged Tern
Martial Eagle	African Crake	African Green Pigeon
Crowned-Eagle	Spotted Crake	Tambourine Dove
Black-chested Snake-Eagle	Baillon's Crake	Emerald-spotted Wood-Dove
Short-toed Eagle	Corn Crake	Blue-spotted Wood-Dove
Brown Snake-Eagle	Black Crake	Namaqua Dove
Western Banded Snake-Eagle	Common Moorhen	African Olive Pigeon
Black-winged Kite	African Purple Swamphen	Speckled (Rock) Pigeon
Black Kite	Grey Crowned Crane	Red-eyed Dove
European Honey-Buzzard	Kori Bustard	Ring-necked Dove
African Cuckoo-Hawk	White-bellied Bustard	Dusky Turtle Dove
Bat Hawk	Black-bellied Bustard	Laughing Dove
African Harrier-Hawk	African Jacana	Meyer's Parrot
Pallid Harrier	Black-winged Stilt	Ross's Turaco
Montagu's Harrier	Water Thick-knee	Schalow's Turaco
African Marsh Harrier	Spotted Thick-knee	Bare-faced Go-away-bird
Eurasian Marsh Harrier	Three-banded Courser	Eastern Grey Plantain-eater
Gabar Goshawk	Temminck's Courser	Jacobin Cuckoo
African Goshawk	Ringed Plover	Levaillant's Cuckoo
Little Sparrowhawk	Kittlitz's Plover	Great Spotted Cuckoo
Black Sparrowhawk	Three-banded Plover	Black Cuckoo
Lizard Buzzard	Caspian Plover	Red-chested Cuckoo
Common Buzzard	Blacksmith Lapwing	Common Cuckoo
Augur Buzzard	Spur-winged Lapwing	African Cuckoo
Lanner Falcon	Senegal Lapwing	African Emerald Cuckoo
Peregrine Falcon	Black-winged Lapwing	Klaas's Cuckoo
Eurasian Hobby	Crowned Lapwing	Diderick Cuckoo
Grey Kestrel	African Wattled Lapwing	White-browed Coucal
Lesser Kestrel	Greater Painted Snipe	Black Coucal
Common Kestrel	Little Stint	Barn Owl
Amur Falcon	Curlew Sandpiper	Spotted Eagle-Owl
Common Quail	Ruff	Verreaux's Eagle Owl
Harlequin Quail	Spotted Redshank	Pel's Fishing Owl

Pearl-spotted Owlet	Malachite Kingfisher	White-headed Barbet
African Wood-Owl	African Pygmy Kingfisher	Double-toothed Barbet
Marsh Owl	Giant Kingfisher	Usambiro Barbet
Montane Nightjar	Pied Kingfisher	Scaly-throated Honeyguide
Eurasian Nightjar	European Bee-eater	Greater Honeyguide
Square-tailed Nightjar	White-throated Bee-eater	Lesser Honeyguide
Dusky Nightjar	White-fronted Bee-eater	Rufous-necked Wryneck
Swamp Nightjar	Little Bee-eater	Nubian Woodpecker
Pennant-winged Nightjar	Cinnamon-chested Bee-eater	Golden-tailed Woodpecker
African Palm Swift	European Roller	Cardinal Woodpecker
Common Swift	Lilac-breasted Roller	Bearded Woodpecker
African Black Swift	Broad-billed Roller	Grey Woodpecker
Horus Swift	African Hoopoe	White-tailed Lark
Nyanza Swift	Green Wood Hoopoe	Rufous-naped Lark
Mottled Swift	Common Scimitarbill	Flappet Lark
Alpine Swift	Abyssinian Scimitarbill	Fawn-coloured Lark
White-rumped Swift	Southern Ground Hornbill	Red-capped Lark
Little Swift	Von der Decken's Hornbill	Fischer's Sparrow-Lark
Speckled Mousebird	Crowned Hornbill	Banded Martin
Blue-naped Mousebird	African Grey Hornbill	Brown-throated Sand Martin
Narina Trogon	Black-and-white-casqued Hornbill	Common House Martin
Grey-headed Kingfisher	Yellow-rumped Tinkerbird	Grey-rumped Swallow
Woodland Kingfisher	Red-fronted Tinkerbird	
Striped Kingfisher	Spot-flanked Barbet	

Maasai Mara National Reserve Reptiles and Amphibians

Leopard Tortoise	Helmeted	Gabon Viper	Marbled Snout Burrower
Terrapin	Afro-Tropical Ground	Guttural Toad	Red Banded Rubber Frog
Tropical House Gecko	Nyika	Bocage's Burrowing Tree	Lake Victoria Clawed Frog
Gecko		Striped Leaf-Folding	
Peter's Worm Snake		Sharp Nosed Reed Frog	
Common Slug-eater		Common Reed Frog	
Small-scaled Burrowing		Golden-backed Frog	
East African Garter		Senegal Kassina	
Black-Necked Spitting Cobra		Northern Foam-Nest	
Forest Cobra		Eastern Groove-Crowned Bullfrog	
Black Mamba		Natal Puddle Frog	
Jameson's Mamba		Anchieta's Ridged Frog	Boettger's
Velvety Green Night Adder		Dainty Frog	
Puff Adder		Mascarene Rocket Frog	