The Thesis of the PhD Dissertation

LEANARD OTWORI JUMA
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HUNGARIAN UNIVERSITY OF AGRICULTURE AND LIFE SCIENCES

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

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List of Abbreviations

CGN	County Government of Narok
H_o (-)	Null hypothesis (number)
IBA	Important Bird Area
KENPRO	Kenya Projects Organisation
KM	Kilometres
MMNR	Masai Mara National Reserve
MMWCA	Maasai Mara Wildlife Conservancies Association
n	Sample size
N	Total population
NI	Nature Interpretation
p	Confidence interval
Q (_) KII(_)	Questionnaire item (number), Key informant interview (number)
q	Error margin
QR-code	Quick Response code
SRS	Simple Random Sampling
x^2	*Chi-Square*

1.0. BACKGROUND OF THE STUDY AND ITS AIMS

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 by Raasch (2004) established that nature-based tourism is among the rapidly growing segments in new tourism markets Consequently, all stakeholders should carefully direct, mitigate, and manage these heavy visitation impacts for sustainability if possible. Albrecht (2017), define visitor management as the summation of all practices and programs implemented to ensure visitors realise quality experiences, using initiatives that concurrently support a destination area's aggregate conservation objectives. That is, safeguarding and augmenting the resource, helping guests enjoy their visit, and; sustaining and expanding the economic benefits tourism can bring.

Besides research by Eagles et al., (2014) supported the opinion that NI can be used as a non-obtrusive visitor management strategy. Haring (2014), asserts that NI as a visitor management strategy chooses and delivers messages while appreciating its impact on protected areas and visitors. Indeed, NI is delivered through personal and non-personal forms like tour guiding services, maps, and orientation signage. Therefore, NI has been defined as an educational activity that endeavours to reveal meanings and interrelationships through firsthand experiences or by illustrative media rather than merely communicating factual information (Tilden, 1977; as cited in Juma, 2016; and 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.

Research conducted at Kinabalu Park in Malaysia reveals an increasing demand for guiding services and interpretation at destinations (Edinborough et al., 2008; Zuliskandar, 2017). Indeed, research carried out at Mombasa marine park and reserve in Kenya, identified NI 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). However, Ikiara & Okech (2002) identified inadequate nature and cultural interpretation of natural 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. Indeed, Edinborough 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

Globally there is increased demand for nature-based tourism destinations like MMNR, which receives hundreds of thousands of visitors annually. Even though high visitation presents an opportunity for revenue generation, this also portends the challenge of potential adverse impacts that threaten the sustainability of the very natural resources upon which tourism depends. This scenario presents a visitor management dilemma of balancing 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 visitor managers. In addition, NI is rarely monitored and evaluated for effectiveness. The issue becomes more complex as the application of NI as a visitor management strategy is implemented by many stakeholders, each having different priorities. The vast MMNR with strained patrols to enforce compliance left NI to self-regulate visitor and driver guides' behaviour during wildlife viewings. Therefore, the question was whether NI regulated wildlife viewers' behaviour in MMNR.

1.3 Specific Objectives of the Study

The specific objectives of the research were to:

i) Establish the extent to which demographic characteristics of wildlife viewing participants affect the behaviour exhibited at MMNR, Kenya.

ii) Determine how tour guiding affects the behaviour exhibited by wildlife viewing participants and what thematic areas should be included in developing a new training curriculum for tour guides at MMNR, Kenya.

iii) Find out how non-personal forms of NI affect the behaviour exhibited by wildlife viewers at MMNR, Kenya.

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

1.4. Research Questions

This study sought to answer the following research questions: -

i) To what extent do the demographic characteristics of wildlife viewing participants affect the behaviour exhibited at MMNR, Kenya?

ii) (a) How does tour guiding affect the behaviour of wildlife viewing participants?

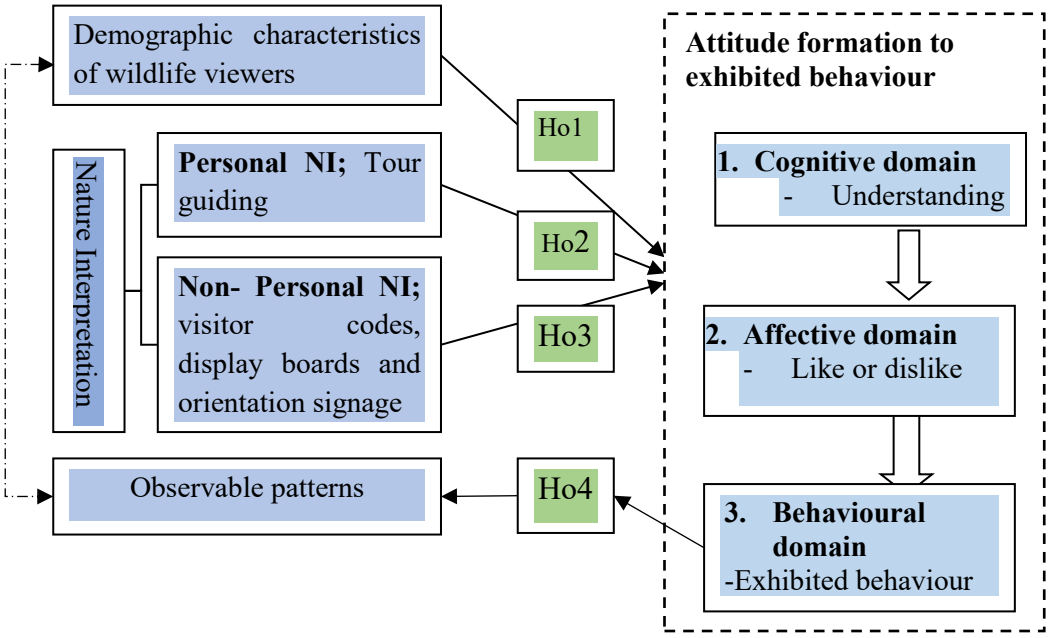
(b) What thematic areas should be included in a new training curriculum for tour guides at MMNR, Kenya?

iii) How do non-personal forms of NI affect the behaviour exhibited by wildlife viewers at MMNR, Kenya?

iv) What is the observable wildlife viewing behaviour patterns exhibited by tourists and driver guides at MMNR?

1.5 Conceptual Framework and Research Hypotheses

The demographic characteristics of wildlife viewers and types of NI, that is,



KEY: $Ho_{(..)}$ – Null Hypothesis

Figure 1.1: Conceptual Framework Source: Reviewed literature and researcher (2020)

tour guiding, visitor codes of conduct, display boards, and orientation signage,

are the independent variables (Figure 1.1). Behaviour regulation is the dependent variable defined by the attitude formation process and, ultimately, the displayed behaviour. Whereas the attitude-forming process is an inward process within individuals, the study evaluated the resultant intentions and behaviour through survey and observation methods. The research premise was that tour guiding services, visitor codes maps, and orientation signage, were the objects that influence wildlife viewers' attitudes. Consequently, the resultant behaviour supports or defies conservation initiatives. Thus, the study hypotheses were as follows: Hypothesis (Ho1) - the demographic characteristics of wildlife viewers did not affect the behaviour exhibited; Hypothesis (Ho2)- tour guiding as a personal form of NI did not affect the behaviour exhibited by wildlife viewers. There is no relationship between non-personal forms of NI (visitor codes, information centres, directional and orientation signage) and the behaviour exhibited by wildlife viewers (Ho3). And finally, hypothesis four (Ho4) there were no spatial behaviour patterns exhibited by wildlife viewers at MMNR, Kenya

1.6. Significance of the Study

High visitation to MMNR expose the protected area to harmful influences. Secondly limited patrolling staff, NI has been left to regulate tourist and driver guide behaviour in this vast ecosystem. NI in visitor management covers multiple goals and involves various parties, complicating the situation. Unregulated, incompetent freelance tour guides make matters worse. Thus, this study examined how NI can be used to regulates wildlife viewing behaviour in MMNR as a visitor management strategy. The study provided a gestalt knowledge of NI as a destination and visitor management strategy, allowing for evaluation of its effects on behaviour regulation and protected area management goals. The research also established an information-sharing

mechanism for commercial sector parties and conservation organizations to execute and enforce visitor rules. The study presented insights that can aid public sector tourism planning and visitor management policy formulation for NI. The County Government of Narok (CGN) had an opportunity to reassess its NI efforts to balance conservation and tourist satisfaction goals. Land use planning and zoning following wildlife observation patterns. The study also expanded the understanding of using NI in visitor management through behaviour regulation and laid the groundwork for future research.

2.0. MATERIALS AND METHODS

2.1 Research Design

This explanatory, descriptive study employed mixed approaches (Tonon, 2019). This design first collected quantitative or qualitative data, then data that explained the first phase's findings. Several scientists have applied explanatory research in visitor management studies in nature conservation areas (Kubo & Shoji, 2016). This research employed questionnaires, observation checklists and interviews to validate quantitative results.

2.2 Study Population and Sample Size Determination

The target population is the full set of observations from which a sample is taken. It is a group of institutions, people, or things with a common trait for research (Tonon, 2019). The sample size is the number of items/respondents chosen from the target population (Tonon, 2019).

Table 2.1 Sample size determination and distribution

No	Respondent category	Study population	Sampling rule and technique	Sample size	Data collection tool
1	Visitors	79632*	• KENPRO (2012). • Simple Random Sampling (SAM)	413	• Questionnaire
2	Tour guides	1373*	• KENPRO (2012). • SAM	157	• Questionnaire
3	Tourist vehicle	1373*	• KENPRO (2012). • SAM	388	• Observation checklist
4	Visitor managers	20*	• 30% rule • Purposive sampling	9	• Interviews
			Totals	967	

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

This study focused on MMNR NI stakeholders. The sample size was determined by the formula KENPRO (2012). Whereby: 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 1.96^2), 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%) and 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.

$$n = \frac{x^2 NP\ (1-P)}{d^2(N-1)+x^2P(1-P)}$$ (KENPRO, 2012).

The study thus sampled 413 guests, 157 tour guides, 388 vehicles tracked, and seven (9) tourist managers (Table 2.1 below).

2.3 Data Analysis and Interpretation

Data collected from questionnaires, n=570 (tour guides and visitors), were used to answer objectives one (i) and three, three (iii), tour guides (n=157) for objective two (ii) and lastly, n=388 (tour vehicles tracked) to answer objective four (iv) using 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.

Data collected using interviews (n=9) was analysed qualitatively using NVivo (version 13) content analysis and verbatim quotations to validate quantitative data findings. Similarly, qualitative data from the questionnaire was used to collaborate with the results from the quantitative analysis of objectives (i), (ii), (iii), and (iv) or hypotheses Ho1, Ho2, Ho3, and Ho4.

2.4 Respondents Demographics

The study used both descriptive and inferential statistics. Spearman's correlation was used to assess research hypotheses using Akoglu (2018)

correlation coefficient rankings. Six months of data collection wwerecarried out, and 51% of responders were in the high season, and 49% were in the low season, giving a total sample size of n = 570. MMNR visitors were 67.5% Kenyans, 18.7% non-residents, and 13.7% resident foreigners. 61.9% male, 36.3% female, and 1.8% others. 157 of the 570 responders were tour-driving guides, who were mostly male. As one interviewee stated, "*foreign visitors declined dramatically owing to COVID-19, but domestic travellers surged on the reverse side*." [Q1KII7, Tourism Officer].

The bulk of respondents was 25–40 years old (54.4%), followed by 41–65 years old (29.1%), under-24 years old (14.6%), and seniors (66 years and older) at 1.9%. Due to the COVID-19 pandemic, senior citizens made up a far smaller share of travellers than pre-COVID-19. 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% had secondary education, and 1.2% had primary. 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 minor fraction (1.6%) were visiting for other work-related activities.

The study found that company tour-equipped vehicles with driver-guides were the most popular (59.3%), followed by local freelance guides (18.9%) and self-drive guests (16%). Self-drive visitors on tour-equipped vehicles utilized MMNR the least. These findings confirmed that "*many tourists are comfortable having services from the specialists; tour company vehicles with driver guides...however tourists on self-drive is a recent phenomenon with the tarmacking of Narok to Sekenani road*." [Q6KII8, Tour Guide Association Chair Person].

3.0 RESULTS AND DISCUSSION

3.1 Effects of Demographic Characteristics on Behaviour

NI's impact on MMNR visitors' behaviour was mostly favourable. After experiencing several NI methods, respondents learned more about nature and wildlife. Wildlife viewers had a positive experience, supported nature interpretive efforts, acted responsibly not to disrupt attractions, followed visitor guidelines and directional information, and financially supported conservation areas, according to the study. Wildlife viewers observed visitor codes and directional signage and learned about nature and wildlife from NI. Wildlife viewers were more informed because NI had the least ambivalence. The result was expected as most respondents said NI improved their wildlife knowledge. Cognition is the first level of behaviour change as it impacts the affective domain (likes and dislikes), and, lastly, it manifests as behaviour.

Results showed that most demographics never affected responses. This result confirms previous research that nature perception is consistent regardless of the touristic season, nationality, age, gender, education level, or vehicle type. It suggested that NI can be implemented year-round without regard to visitor demographics like the month of visit, nationality, gender, age, education level, or vehicle type. A 95% confidence interval showed negligible correlation with visit purpose and (r_s = 0.093, p = 0.027, n = 570). Despite a slight positive link, the aim of the visit affects NI's ability to make wildlife viewers act responsibly and not harm attractions. As the objective of the visit implied attentiveness and connectedness with the site and its features, appropriate behaviour was expected.

Wildlife viewers' endorsement of NI was weakly inversely related to month, age, and vehicle type. As the year progressed into the high season, support for NI decreased and vice versa. The excitement of the wildebeest migration and

prey-predator wildlife interactions may have made people forget to act appropriately in MMNR.

Table 3.1: 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 significant at the 0.05 level (2-tailed).

No correlation, Accept null hypothesis | **Very weak correlation**; Reject the null hypothesis

(Research Data, 2022)

Strangely, NI support decreased with ageing. The same trend was seen for vehicle types, from self-drive on an ordinary vehicle to self-drive on a tour-equipped vehicle, driver-guide with a company-equipped vehicle, and local freelance guides with a tour-equipped vehicle. Self-drive visitors supported nature interpretive services more than local freelance driver guides. Most MMNR NI weak points comments reflected this.

Nationality and visit purpose revealed a weak positive connection with wildlife viewers supporting nature interpretation activities. These data indicated a weak direct association between nationality and purpose of visit and wildlife viewers supporting NI activities. The confidence interval was

95%, suggesting minimal associations when one variable increased. In addition, wildlife viewers supported nature interpretation initiatives regardless of gender or education, contrary to conventional belief.

Very weak negative correlations suggested a weak indirect association between conservation area financial support and nationality or purpose of visit. Wildlife viewers who were not motivated by NI to support conservation areas financially did not correlate with the month of visit, gender, age, education level, or vehicle type. Wildlife viewers enjoyed NI, which showed two very weak negative relationships with the month of visit and education level. As one variable increased, the other declined. NI gave wildlife viewers a gratifying experience regardless of ethnicity, gender, age, the purpose of visit, or vehicle type. NI gave wildlife viewers a pleasurable experience with minimal or no relationships to most demographic factors.

The hypothesis if the demographics of wildlife viewers affected MMNR behaviour was partially supported by mixed correlations between wildlife viewer demographics and behaviour variables (Table 3.1 above). Nevertheless, these correlations were weak and marginal. NI educated wildlife viewers about nature and wildlife, behaved responsibly not to affect attractions, and obeyed visitor guidelines and directional signage linked with vehicle type, rejecting the null hypothesis. Wildlife was unrelated to age, the month of visit, education, the purpose of visit, nationality, or gender. The null hypothesis was accepted because viewers learned about wildlife, behaved responsibly, and obeyed visitor guidelines and signage.

Behaviour attributes wildlife viewers supported NI efforts correlated with the type of vehicle used, gender, nationality, the month of visit, and education level. Therefore, the null hypothesis was rejected. On the hand, wildlife

viewers supported NI efforts did not correlate with age and the purpose of the visit, and thus the null hypothesis was accepted. 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, the purpose of visit, and nationality did not correlate or affect wildlife viewers' financial support for conservation areas.

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.

3.2 Effect of Tour Guiding Delivery on Wildlife Viewers' Behaviour

Tour guide attributes received affirmations ranging from 78.2% to 58.1% of responses. Tour guides understood wildlife (78.2%), had good tour guiding abilities (73.4%), provided informative natural commentary (71.1%), and explained visitor codes/dos and don'ts (64.6%). Despite the 15.1% to 27.4% ambivalence rate, these affirmations mostly supported MMNR tour guides' competencies. Ambivalence was highest on "tour guides required regular interpretational training and sensitisation" (27.4%). A finding that suggested tour guides' training backgrounds were unknown, despite emphasising the necessity for retraining. Negative attitudes for all tour guiding abilities and skilling dummy variables were quite low, ranging from 6.5% to 14.5%. Most

respondents had good sentiments after MMNR tour leaders interpreted nature for them.

Tour guides need regular interpretation training, and wildlife viewers' behaviour showed a weak positive connection with sensitisation. The finding might have been because the question suggested tour guide training and that it did not immediately affect wildlife viewers' opinions or behaviour. Tour guides benefit from training since it improves their skills and abilities. Wildlife viewers "financially supported conservation areas" had weak positive connections with all tour guide delivery qualities. Visitor codes "are communicated to tourists by tour guides" were the only exception.

Table 3.2: Tour guide attributes versus wildlife viewers' behaviour (n=570)

Behaviour Attributes		Tour Guides Communicates do's and do nots	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)

The second-ranked "wildlife viewers acting responsibly, not impacting attractions" had very weak and weak associations. 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 don’ts," “have a good understanding of wildlife," “have good tour guiding skills," “provide enlightening NI,” and “tour guides communicated visitor codes to tourists.” All qualities again showed a slight positive connection with “tour guides required regular interpretation training and sensitisation,” except for “wildlife viewers supported NI efforts,” which did not.Weaker positives outnumbered very weak positive correlations. Tour guiding had a minimal direct effect on MMNR wildlife viewers’ behaviour. Thus, other factors, such as visitor codes, maps, orientation signage, and visitor information centres, may have affected wildlife viewers’ behaviour. The study also asked respondents if MMNR tour guides needed a new training curriculum. 45.8% of respondents approved MMNR’s revised tour guide training curriculum, 32.1% were undecided, and 22.1% opposed it. Many were ambivalent since they did not know what it takes to be a tour guide, the tour guides’ training Background, or how to evaluate them in a short interaction time these notwithstanding tour guide training improves competences.

The null hypothesis tour guiding delivery does not affect the behaviour exhibited by wildlife viewing participants was largely rejected for most behaviour attributes (Table 3.2 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 accepted. 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 don'ts'.

3.2.1 Proposed thematic areas for insitu new training curriculum

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 13 to determine the themes and weighted word frequencies. Qualitative data indicated six key themes ranked by weighted frequency in Table 3.3, as discussed below.

Table 3.3: 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
		99.4

(Research Data, 2022)

First was, professional code of conduct and tour guiding legislation (28.97%) had the highest ranking. Despite respondents' perceptions suggesting tour guides were competent, qualitative data showed room for improvement. Responses also revealed that tour guides' professional behaviour and conduct

would improve the destination's image and ensure tourist pleasure, repeat business, or referrals. Successful destination visitor impact management relies on knowing the wilderness code of ethics and behaviour and explaining it to tourists. 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. Thus, good customer service and NI will help visitors enjoy themselves, have a memorable experience, and act responsibly because they will know what is expected of them.

Wildlife identification, distribution, and natural history were ranked third (18.12%). The biodiversity-rich MMNR natural grasslands are famous and host 25% of Kenya's fauna. It is an Important Bird Area (IBA) with over 550 bird species and over 95 wildlife species (Masai Mara Wildlife Conservancies Association (MMWCA), 2022). NI requires knowledge to identify and describe this rich biodiversity's behaviour, distribution, and other distinctive information. Wilderness navigation, safety, and survival were the other qualitative data theme. Rangers and tour guides should easily navigate the reserve for effective, efficient, and enriching NI. Tour guides need wilderness navigation, safety, and survival skills to be safe and save time in the vast MMNR ecosystem. Some minor wildlife routes are unmarked to avoid visual pollution with many signage and display boards, or the trails are not hardened for higher vehicle traffic. Thus, competent wilderness navigation skills ensure repeatable and hassle-free wildlife viewing in the wild.

Understanding and predicting wildlife behaviour and managing wildlife encounters for tourist enjoyment without irritating or jeopardising wildlife or other reserve users at wildlife sightings. Understanding wildlife behaviour and psychology help spot them easily, predict their behaviour, and act responsibly.

Wildlife viewers often harass wildlife by 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 posing risks to wildlife viewers. Conservation and protected area management were also proposed as the other thematic area. Tour guides need a basic understanding of conservation and park management to interpret nature and comprehend park management to teach wildlife viewers conservation principles.

3.3 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. Display boards outshone visitor codes and visitor information centres. Visitor information centres were scarce and lacking at most essential locations. Non-personal NI, unlike tour guiding, should be scaled up. Despite these findings, visitor codes, display boards, and directional signage were easy to read and earned the highest scores. Tour guide-communicated visitor codes, display boards, and directional signage ranked second. The majority agreed that visitor codes, display boards, and directional signage are visible and Are of the right size. Visitor codes, exhibit boards, and directional signage are strategically located despite being few. The diversity and integrated implementation of these soft visitor management tactics will be more effective than relying on one approach. Despite these criticisms, the study found that the few visitor codes, display boards, and directional signage were properly designed and presented, utilising adequate size, location, visibility, and legibility.

Wildlife viewers may ignore visitor rules and orientation signage due to tourist pressure for better views and pictures (77.2%) and the desire to provide tourists with a memorable experience (71.8%). Ignorance of visitor code

penalties (46.5%) scored high. These findings call for urgency in enforcement, awareness creation, and tour guide training and workshops for both the Mara Triangle and Greater Mara during high season. Innovative tourist information centres at the gate are envisaged to raise public awareness before entering the MMNR.

3.3.1 Objective Three: Correlations and Hypothesis Testing

Wildlife viewers' "being more informed about nature and wildlife" and "financially supporting conservation areas" had few correlations with all the attributes of non-personal NI. Wildlife viewers "were more informed about nature and wildlife" correlated with all non-personal NI variables. These were visitor codes, display boards, and orientation signage that were "too many," "strategic," "proper size and visible," "simple to read and understand," and "communicated to tourists by tour guides". The null hypothesis that wildlife viewers' behaviour did not correlate with non-personal NI was largely rejected (Table 3.4). Because wildlife viewers in MMNR behaved differently after non-personal NI, the alternative hypothesis was adopted. NI made wildlife viewers behave appropriately and not impact attractions. The questionnaire items "non-personal forms of nature explanation are too many," "are strategically positioned," "are of an adequate size," "are easy to read and understand," and "are communicated to tourists by tour guides" showed correlations. Instead, the alternative hypothesis was adopted because wildlife viewers in MMNR behaved differently after non-personal NI. The behaviour attribute "NI made wildlife viewers act appropriately and not affect attractions" did not correspond with visitor codes, and direction signages "are too many". The null hypothesis was not rejected. 'Wildlife viewers observe visitor codes and directional signage', 'support NI efforts', and 'get a satisfying experience' showed similar results.

Table 3.4: 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 & 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)

The questionnaire item non-personal forms of NI "are too many," "strategically situated," "suitable size," "simple to read and understand," and "communicated to tourists by tour guides" corresponded with these behaviour traits. The null hypothesis was rejected since wildlife viewers "followed visitor guidelines and directional signage," "supported NI initiatives," and "received a satisfactory experience" from non-personal NI.

Finally, wildlife viewers "supported NI efforts" did not correlate with "too many" non-personal NIs (visitor codes, display boards, and directional signage); thus, the null hypothesis was not rejected. However, the other four non-personal NI traits revealed weak positive relationships. They are

strategically placed, large, prominent, easy to read, and presented to tourists by tour operators (Table 3.4). 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'*. 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.

3.4 NI Impact on Wildlife Viewers' Spatial Behaviour Patterns

The research tracked wildlife viewers and their vehicles to determine their behaviour. For six months, 388 tour vehicle observation checklists were filled. November, December 2020, January, February, August, September, and October 2021. The study found that August 2021 (31.4%) was the peak season, followed by December (22.9%) and November (20.6%). January and February 2021 had 10.8% and 1.9% of the total observations (n=388), whereas September 2021 had 2.3%. These results depicted MMNR's tourist seasons and cyclic visitation patterns.

Although small wildlife were most prevalent in MMNR, study results showed they were less valued or viewed when the trucks moved. Big cats' spectacular hunts, killings, feasting, and naps around their kills were a key attraction. During hot days, cats were less active making them easily accessible to wildlife viewers and vehicles due to their inactivity. The situation was different for large herbivores or small wildlife species that shied away from vehicles or were always in motion as they grazed in the rolling savanna, alert or fleeing predation risks.

Despite a visitor rule to keep at least 25 metres from wildlife, 46.7% of MMNR visitors drove closer. As wildlife viewers got unduly excited, tour operators drove too close or surrounded wildlife with multiple vehicles, distressing them. A scenario that was wildlife harassment and potentially risky to safari jeep passengers. In this case, ranger patrols and strict enforcement with punitive penalties are deemed sufficient in the short term, especially during high tourism months and morning hours. Thus, long-term tour guide retraining and awareness creation can be crucial. 29.9% of wildlife-viewing vehicles stopped for five minutes or less, according to the current study. 45.4% spent between 6-15 minutes. 75% of tour vehicles spend less than 15 minutes viewing wildlife. Long periods of wildlife viewing are not only harassment but can also lead to habituation. 25% If tour vehicles stayed longer than 16 minutes.

Overspeeding and littering at wildlife sightings were not major concerns in MMNR. Poorly maintained all-weather roads and trails prevented overspeeding above the recommended 50kph. At sightings, wildlife viewers were busy photographing or monitoring the wildlife attractions, unlike at picnic locations and the migration crossing 'Look out,' where alighting from vehicles for relaxation or in areas without basic amenities like bathrooms or dustbins quickly got littered.

3.4.1 Correlation Analysis of Observed Behaviour Patterns

The month of observation did not correlate with tour guides respecting other reserve users, game drive participants littering, and drivers obeying speed limits, as they had *p-values* of over 0.05. The month of visiting did not alter tour guides' respect for other reserve users, trash, or speeding. This conclusion ephasizes that actions to minimise these behaviours should not depend on the touristic season. The tourist season had a modest negative connection with

group size, sighting duration, off-road driving in restricted areas, and wildlife harassment. As the year and tourism season progressed, the number of tourists in a wildlife viewing group, length at a sighting, off-road driving, and wildlife harassment decreased. This observation suggested that larger groups travel during the low season or early months, while smaller group sizes later in the year. The great wildebeest migration accounts for the high tourist season.

Secondly, although the negative effect was modest, the duration at a wildlife sighting decreased in the high season compared to the low season. This scenario could be attributed to the high season's availability of large numbers of wildlife when more sightings were guaranteed and less time was spent at a sighting. In the peak season, off-road driving in restricted areas and wildlife harassment decreased compared to the low season (Table 3.5), due to greater policing and patrols, high wildlife density and sighting. The study found higher hooting in the high season. This conclusion may be due to vehicle congestion during less-organized sightings, which made tour drivers impatient (Table 3.5).

Observation month correlated weakly with observation time, wildlife type, and estimated distance from wildlife. As the number of visitors increased by season, the time visitors went for wildlife viewing changed to later hours. Wildlife sought to include big cats and even small game, and the estimated distance from wildlife sightings also increased. Wildlife viewers' behaviour throughout the month of visit/observation differed by time, type of wildlife sought, and distance from wildlife at a sighting. Two other weak negative relationships with the visitation month were the number of vehicles and crowding were stablished (Table 3.5). These findings showed an inverse association between visit month and crowding at a sighting. Overcrowding resulted from the number of vehicles at a sighting; according to reserve rules,

Table 3.5: Observation Correlation matrix for Wildlife Viewers' Spatial Behaviour Patterns (n=388)

	Observation Attributes		month	observation time	number 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
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 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_o | **Very weak correlation-** Reject H_o | **Weak Correlation** – Reject H_o | **Moderate Correlation** – Reject H_o | **Strong Correlation** – Reject H_o

six or more was considered overcrowding. The result demonstrated a weak negative association between congestion and the tourist season or month of visitation. The correlations between the month of visit and behaviour variables produced mixed marginal results. Thus hard and soft visitor management. measures should be integrated and performed with little variation from season to season.

The study also associated wildlife viewers' time at a sighting with other visible features. The study found no correlation between observation time and respect for other reserve users, littering, or hooting/making noise. Thus, the time of day wildlife viewers visits MMNR does not affect their respect for others, littering, or hooting/noise. These data showed that as the day progressed from morning to evening, the number of tourists in the tour group, congestion at a sighting, and harassment of wildlife decreased. These results suggested that morning interventions should be slightly more frequent in the morning than evening for stringent/hard visitor management strategies like ranger patrols, penalties, and other regulatory mechanisms.

In addition, the observation time and wildlife category had a weak positive association. As the day progressed from morning to sunset, more large herbivores and small wildlife were seen than big cats. Study results also found a moderately indirect association between observation time and vehicle count at a sighting, off-roading in prohibited regions, and duration at a sighting. As the day progressed from 6 AM to 6 PM, off-road driving, vehicle count, and wildlife viewing time decreased. Early morning wildlife viewing had more vehicles, more off-road driving, and longer duration. All these behaviour traits decreased throughout the day. This could be because wildlife viewers had ample time to view wildlife in the early morning, when wildlife was active and more exciting. Many incidences of wildlife harassment, driving too close

to wildlife, overcrowding, off-road driving, or extended stay at a wildlife observation occurred in the morning. As the number of vehicles at a sighting increased, so did tourist numbers and crowding. As tourist numbers increased, so did sighting duration and wildlife disturbance. Many people at a wildlife sighting meant disorder; thus, wildlife viewers spend extra time getting a better view, especially for photography; overcrowding and wildlife harassment increased with lengthier stays.

Further to these, As the number of tourists increased at a sighting, a big cat Was more likely to be the attraction of attention. As visitor numbers at a sighting declined, small game and large herbivores were the possible attraction at the sighting. This research revealed that wildlife tourists preferred big cats over other wildlife. There was a modest negative association between the number of visitors at a sighting and driver respect for other reserve users and hooting. As the number of tourists at a sighting increased, the estimated distance from wildlife decreased, and drivers hooted and disrespected each other.

As the number of vehicles at a sighting grew, so did wildlife viewing time and harassment. Driver guides blocked each other's better views and paths or overstayed at a sighting as the number of vehicles increased; they drove closer for a better view, reducing the estimated distance from wildlife (Table 3.5). As the number of tour vehicles and tourists in a sighting rose, off-road driving and noise/hooting also increased. Overcrowded Wildlife sightings led to wildlife harassment. Overcrowding resulted in a moderate increase in vehicles and wildlife viewers' time at a sighting. Congestion at a sighting intensified from small wildlife to large wildlife and big cats on the higher extreme. Overcrowding was more linked to big cat sightings than large or small

wildlife. In addition to these findings, overcrowding at a sighting negatively correlated with wildlife distance and driver respect for other reserve users.

The wildlife category correlated positively with wildlife viewing distance. Big cats were viewed close up, whereas large herbivores and little fauna were viewed from far away. Duration at a sighting and harassing wildlife correlated negatively with the wildlife category. Big cats were viewed longer and bothered more than large wildlife and small fauna. Results showed that big cats were a factor in off-roading in prohibited areas decreased. The estimated distance from wildlife decreased with wildlife harassment increase and vice versa. Wildlife distance had weak negative relationships with sighting length and off-road driving in restricted areas.

As the estimated distance between wildlife viewers and wildlife at a sighting rose, tour drivers were slightly more likely to respect other reserve users. The farther a sighting is, the less they scramble and block each other to see the wildlife. Wildlife viewers spent longer at sightings when closer to and were thus more likely to snack or litter. Despite these findings, speed limit compliance was unrelated to estimated wildlife distance at a sighting. Wildlife harassment substantially increased with wildlife sighting duration. Study results revealed a weak association; as length at a sighting increased, off-road driving cases in restricted areas increased somewhat and vice versa. The length of stay at a sighting increased hooting and noise-making slightly. As time at wildlife sightings increased, respect for other reserve users decreased, and wildlife viewers littered more. Vehicles were mostly immobile at sightings or overcrowded by other vehicles; therefore, there was little need to speed. Finally, speed limit observance did not correspond with the length of time at a sighting.

4.0. CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

4.1.1 Effects of Demographic Characteristics on Behaviour

NI improved MMNR tourist behaviour; interpreting nature and fauna changed respondents' behaviour through an informed mindset to act responsibly. According to the study, wildlife viewers enjoyed their visit, supported NI, did not harm attractions, and supported conservation Areas. Although descriptive statistics showed that NI helped wildlife viewers follow visitor codes and orientation signage, inferential statistics indicated that it did not improve conservation funds. The study suggested using all NI techniques year-round, as results revealed that they worked regardless of month, nationality, gender, age, education level, or vehicle type. On the other hand, the visit's purpose hindered NI's ability to make tourists act ethically and not negatively impact attractions. It emphasised awareness and connection to the location of the visit and its attributes, requiring appropriate behaviour. In addition, wildlife viewers' support for NI also showed weak inverse associations with the month of visit.

Furthermore, as seasons changed, NI lost support from wildlife viewers. It was also observed that as the age of respondents Increased, support For NI Reduced while young people were observed to value NI and conservation. Visitors on self-drive promoted NI more than driver guides. Similarly, gender and education did not alter NI support. Conservation area financing and nationality or visit purpose were weakly correlated. Nationality, visit purpose, and NI was slightly correlated.

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

Tour guides were praised for their wildlife knowledge, leadership, NI, and communicating visitor dos and don'ts. These findings supported tour guides'

visitor management role. Indeed, MMNR wildlife viewers' behaviour was weakly associated with tour guiding. And that despite 15.1% to 27.4% ambivalence, the affirmations mostly endorsed MMNR tour leaders' ability. Most ambivalence was on "tour guides need regular interpretational training and sensitisation" (27.4 per cent). Tour guides needed regular interpretation training and sensitization to competently and consistently impact wildlife viewers' behaviour. Wildlife viewers learned, obeyed visitor guidelines, supported wildlife interpretation, and had a satisfying experience with tour guides. Tour guides were observed to be knowledgeable, delivered informative nature commentary, and explained tourism codes to visitors. Except for wildlife viewers favouring NI, all attributes showed a weak positive connection with tour guides require interpretation training and sensitization. Visitor codes, maps, orientation signage, and visitor information centres may have influenced wildlife viewers. Wildlife viewers were slightly impacted by tour leaders' refresher training and sensitization.

45.8% supported MMNR's new tour guide training programme. 22,1% opposed, 32,1% uncertain. The great ambivalence might have been that many were ignorant of what a tour guide does, the tour guide's training, or the tour guide's delivery. The qualitative analysis ranked six key themes for a revised MMNR tour guide curriculum by weighted frequencies. Most respondents (28.97%) ranked the professional code of conduct first, indicating that visitor management relied on tour guides and guests comprehending the wilderness code of ethics and conduct. Despite the tour guides' competence, qualitative results showed room for Improvement, and that tour guides required professional training, fulfilling one of Kenya's tour guide legal conditions. Customer care and public relations was placed second (19.24%), with participants indicating that general NI was vital to guest comfort, satisfaction,

wonderful word of mouth, and repeat business. Good customer service and nature interpretation enable travellers have pleasant experiences and act responsibly because they know their duties.

NI identifies biodiversity and uses its behaviour, distribution, and other data to explain how, when, and why things are the way they are. Interpreters should therefore be conversant with all the wildlife in MMNR because they are not only an attraction but also `enhance tourist experiences, as do print, book, signpost, electronic, and tour guide material. Another theme was wilderness navigation, safety, and survival. For visitor safety, efficiency, and experience, nature interpreters and facilitators should navigate the area effortlessly. Tour guides provide physical access, encounters, intellectual access, and empathy/inspiration as destination advocates. Tour guides must grasp their role in park or destination administration to represent responsibly.

4.1.3 Effect of Non-Personal NI on Behaviour Exhibited

The study investigated how non-personal NI affects wildlife viewing at MMNR. Display boards outshone visitor codes and visitor centres. Despite these vital insights that regulatory communication and information were crucial for visitor management, most key places lacked visitor information centres or points. Non-personal NI was less noticeable and had less impact; thus, it should be improved.

Visitor codes, display boards, and navigational signage received the most favourable ratings. Display boards, orientation signage, and visitor codes were followed, were of the ‘right size and visible’, and “were strategically placed.” However, visitor codes, display boards, and navigational signage “were too many” received mostly negative feedback. Wildlife viewers disregarded rules and orientation information due to tourist pressure for better wildlife

observations and photography (77.2%), tour operators' desire to provide a good experience (71.8%), and visitor code ignorance (46.5%). These results showed the necessity for Stringent patrols, visitor code enforcement, and wildlife viewers sensitization.

Field observation behaviour traits correlated weakly and moderately. 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 showed that non-personal NI promotes responsible visitor behaviour.

'NI made wildlife viewers act appropriately and not impact attractions' associated with the questionnaire item that non-personal forms of NI are strategically positioned, of adequate size, easy to read and understand, and communicated to tourists by tour guides and as such the alternative hypothesis was adopted. NI that made wildlife viewers conduct properly and not impacts attractions did not correspond with visitor codes, and direction signs "were too abundant," therefore the null hypothesis was not rejected.

Wildlife tourists "observe rules and signage," "support natural interpretive efforts," and "have a happy experience" had similar results. The question non-personal NI was "adequate," "strategically positioned," "suitable size," "simple to read and understand," and "communicated to tourists by tour guides." The null hypothesis was not refuted because wildlife viewers supported NI initiatives regardless of non-personal NI availability. Four non-personal NI attributes with weak and insignificant positive relationships

refuted the null hypothesis. These were “strategic”, “visible”, “simple 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 showed that non-personal interpretation works regardless of quantity used but should be clear, simple to read and strategically positioned.

Among the strong points of NI in MMNR recorded were wildlife, park conservation and management, tour guiding, a good experience, the big five, wildebeest migration, visitor codes, directional signage, roads, and trails. On the other hand, the shortcomings of NI at MMNR were cases of wanting tour guiding, law enforcement, signage, lack of information centres, park management and conservation, poor paths and amenities.

4.1.3 NI Impact on Wildlife Viewers’ Spatial Behaviour Patterns

From field observations, although small and large wildlife were abundant in MMNR, but they were less viewed than big cats, making them seem less desirable or viewed when vehicles were going. However, big cats were popular due to their spectacular hunts, killings, feasting, and lounging around their kills. Referrals from wildlife viewers and vehicles made them easily accessible.

46.7% of MMNR wildlife viewers drove closer than the 25-meter limit. Wildlife viewers sought a better experience, and thus tour guides drove too close or encircled big cats with many Vehicles. 75.3% of tour vehicles spent under 15 minutes at wildlife sightings, which was Okay, however long stays resulted in wildlife harassment and potential habituation especially for 25% of tour vehicles which stayed beyond 16 minutes. MMNR did not have a problem

with speeding vehicles or trash at wildlife observations, except at picnic places like the 'Look-out' for the migration crossing, where alighting was allowed because there were no bathrooms or dustbins. Correlational tests showed that tour guides did not change their respect for other reserve users, trash, or speeding by month. As the year went on, wildlife viewing group size, sighting time, off-road driving, and wildlife harassment declined.

The high season saw shorter durations at sightings than the low season. Month of the visit was weakly positively correlated with wildlife viewing time, category, and distance. Seasonal visits extended wildlife viewing hours. Wildlife viewers' monthly behaviour was influenced by when they went out, what they looked for, and the distance from which they viewed wildlife. As the day progressed, group size, congestion, and wildlife harassment reduced. Off-road driving, vehicles, and sightings decreased throughout the day. Longer durations at sightings increased congestion and wildlife disturbance. Big cats were overcrowded and harassed since they drew more vehicles and visitors, indeed, it can be concluded that big cats caused overcrowding. The distance between vehicles and big cats reduced as visitors or vehicles grew at a wildlife sighting. Overcrowding during wildlife sightings encouraged off-road driving, noisemaking, disrespecting other vehicles, ecological degradation, wildlife harassment, and disorderly conduct.

The observation month did not affect driver's respect for Other reserve users, littering, or speeding and thus the null hypothesis was not rejected. The rest of the behaviour attributes correlated with the observation month. These were observation time, number of tourists, number of vehicles at a sighting, overcrowding, wildlife type, estimated distance from wildlife, sighting duration, off-road driving in restricted areas, harassing wildlife, littering and hooting/making noise, thus 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 wildlife. So, the null hypothesis was accepted, and the alternative hypothesis was rejected except for speed, estimated distance from wildlife, and sighting time-correlated with all observable features. In all cases except speeding, the null hypothesis was rejected.

4.2 Recommendations

4.2.1 Operational Recommendations

1) Develop and diligently implement a management plan to cater for land use zoning, species conservation, facility development, visitor management, visitor data collection and monitoring
2) Consolidate MMNR operational management: The Greater Mara, and Mara Triangle management and administration should be merged.
3) Persistence in proactive NI; Instead of reactive visitor management, NI will be fruitful if proactive NI practices, evaluation, and improvement over time.
    - Provide nature interpretive support infrastructure:
    - the ‘Look-out’ and expansive ‘balloon safaris region’ require visitor information signage, permanent all-weather picnic site seats and chairs, bathrooms, and pest-proof dust bins.
    - Road and trail signage: The Greater Mara very few road and trail signage compared to the Mara Triangle.
    - Digitizing NI: mobile app and official website with a scannable QR code poster at gates for information dissemination and NI.
    - Build and equip information centres: The Mara Triangle and Greater Mara had few or no visitor information centres, respectively.

4) Monitoring and compliance enforcement should vary by time of day.
5) Monitoring and surveillance of big cats to prevent wildlife harassment:
6) Regular training and awareness creation: tour driver guides need regular training and awareness creation to improve their competency.
7) Community awareness creation on park management and alternative sustainable livelihoods.

4.2.2 Policy Recommendations

i) Association-regulated tour guides: Membership to tour guide associations be mandatory, and the ministry of tourism should licence all tour guides.
ii) Competency-based evaluation methodology for non-trained tour guides.
iii) Mandatory destination management plans for protected wildlife-based tourism destinations like MMNR.

4.2.3 Future Research

i) Navigation-based tracking systems can accurately map out tour vehicle dispersion and impact density for resource use planning. Results will enable accurate resource use planning, zoning and management.
ii) MMNR freelance/step-on guides' professional performance after training and awareness creation. Some community guides lack tour guide training. These guides were mostly docents or step-on guides for hire by self-drive tourists.

4.3 New Scientific Findings

4.3.1 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 financially support conservation areas.
b) Contrary to popular opinion, education level did not affect support for NI.

c) NI got less support as the year progressed from low season to high season and vice versa with a weak inverse relationships.
d) Support for NI decreased with respondents' age at MMNR. Young individuals favoured NI and were more conscious of conservation issues.
e) Visitors on self-drive supported NI more than tour driver guides contradicting previous studies.

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

a) Study participants appreciated tour guides' wildlife knowledge, tour-leading skills, and nature interpretation in MMNR.
b) six themes for a new MMNR tour guide training curriculum were identified; Laws governing tour guiding, customer service, public relations, identification, history and wildlife distribution, wilderness navigation, safety, and survival. Wildlife behaviour, conservation, and protected area management.

4.3.3 Effect of Non-Personal NI on Behaviour Exhibited

a) Tourist pressure for better wildlife views and photography and tour guides' desire to provide a pleasant experience were the main reasons for not obeying MMNR guidelines and orientation instructions.
b) Strategic, clear, and easily read non-personal interpretation works regardless of quantity. "Acting responsibly not to affect attractions," "supporting wildlife interpretation," "pleasing experience," and "following visitor rules and directional signage" did not correlate with "visitor codes," "display boards," and "directional signs."
c) Wildlife viewers supported NI regardless of non-personal NI availability.
d) Nine strong points were found in MMNR NI; Wildlife, park conservation and management, tour guiding, a good experience, the big five, wildebeest migration, visitor codes, directional signage, roads, and trails. Tour

guiding, law enforcement, signage, poor roads, trails, park administration, and lack of an information centre were the shortcomings in MMNR.

4.3.4 NI Impact on Wildlife Viewers' Spatial Behaviour Patterns

e) Small and large wildlife were common in MMNR, but big cats were most sought after by tourists. Big cats were popular for their hunts, kills, and resting and thus referrals from other visitors made them easily accessible.

f) 46.7% of MMNR wildlife visitors violated the 25-meter rule. Seeking memorable experiences made guides drive too close or overcrowded wildlife.

g) 75.3% of tour vehicles spent 15 minutes or less at wildlife sightings, which was okay. At the same time, 25% of tour vehicles stayed beyond 16 minutes. Longer sightings increased congestion and wildlife disturbance. Big cats were overcrowded and harassed since they drew more vehicles and visitors.

h) Tour guides' respect for reserve users, littering, and speeding did not change by month. As the year went on, wildlife viewing group size, sighting time, off-road driving, and wildlife harassment declined. The high season saw shorter sighting durations than the low season.

i) The average viewing distance at big-cat sightings decreased as the number of tourists or vehicles increased. Overcrowding at wildlife sightings encouraged off-road driving, noisemaking, disrespecting other vehicles, ecological degradation, wildlife harassment, and disorderly conduct.

j) Wildlife viewers' behaviour by month of visit was influenced by when they went out, what they looked for, and how close they were to nature. Observing time had an effect on overcrowding, wildlife category, duration and distance, off-road driving, agitating wildlife, noise, and speed limits. Off-road driving, vehicles, and sightings decreased as the day progressed.

5.0 ACADEMIC PUBLICATIONS

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