Original Submission

Socioeconomic Determinants of Mefou Wildlife Sanctuary Visitors' Willingness to Pay for Seeing Animals in the Wild

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### Socioeconomic Determinants of Mefou Wildlife Sanctuary Visitors’ Willingness to Pay for Seeing Animals in the Wild

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Abstract
Protected areas (PAs) in Cameroon witness chronic underfunding, with most operating with only around 10% of the necessary funds. This study aimed to exploring socioeconomic factors affecting Mefou Wildlife Sanctuary (MWS) visitors’ willingness to pay (WTP) for wildlife species observation in their natural habitat. The study was based on semi-structured questionnaires conducted with 637 respondent and the contingent valuation method was used to estimate visitors' WTP. The findings reveal an average WTP of $US 170 for foreign visitors and SUS 81 for national visitors to see animals in the wild. Income level and education significantly influenced WTP, with higher-income individuals and those with higher education demonstrating a greater willingness to pay. By recognizing the factors that drive visitor spending behavior, policymakers and park managers can implement targeted marketing campaigns and allocate resources effectively. This study emphasizes the importance of providing diverse and high-quality wildlife experiences to enhance visitor satisfaction and encourage repeat visitation and make the country an attractive world destination for eco-tourists. So, the country can contribute to funding conservation while supporting local development and boosting its tourism industry.

Keywords: Eco-tourism, Iconic wildlife species, Mefou Wildlife Sanctuary (MWS), Natural habitat, Protected areas, Visitors, Socioeconomic determinants, Willingness to pay.

1. Introduction
Wildlife conservation and the sustainable management of protected areas (PAs) have gained significant attention globally due to the increasing threats posed by habitat loss, climate change, and poaching (Wilcox et al. 2019). PAs cover 15.3% of the world's terrestrial surface (Spenceley et al., 2017) and are recognized as one of the most effective ways to conserve natural ecosystems and related services (Molina et al., 2019). They also hold the potential for revenue generation through proper investments (Ralph, 2021). Consequently, understanding the socioeconomic factors that influence visitors’ willingness to financially contribute to conservation has become crucial for effective conservation strategies (Huang et al. 2021).

Mefou Wildlife Sanctuary (MWS) is an ex-situ conservation site, located in the vicinity of the capital city Yaoundé. According to Doumenge et al. (2021), it is among the most visited eco-touristic site in Cameroon far ahead of national parks where emblematic species are present in their natural habitat. The MWS thus serves as an outstanding case study for investigating the
complex relationship between socioeconomic determinants of visitors and their willingness to
pay (WTP) for observing animals in their natural environment in Cameroonian National parks. Those PAs not only harbours more diverse wildlife species but also provide numerous ecosystem services and has the potential to contribute to local economies through nature-based tourism (Ivanic et al., 2020; Scholte 2022).

However, like many PAs in the Congo Basin, they face the challenge of inadequate funding for conservation (CBD, 2019). The current funding available for PAs in Cameroon, which predominantly relies on external sources (Pyhälä, 2016; Doumenge et al., 2015), falls significantly short of the required amount, rendering the current conservation model unsustainable with continuous decline of biodiversity (Brugiére et al., 2016; Scholte et al., 2018). Hence, exploring sustainable funding options, such as visitor contributions, becomes paramount.

Tourism has been identified as a sector that can significantly contribute to the funding of PA networks globally CBD, 2019; Leung et al., 2018). When managed sustainably, tourism can play a pivotal role in effective PA management, as demonstrated by successful cases in various African parks. For instance, profitable tourism activities have covered a significant portion of the operational costs in Zakouma National Park, Chad (APN, 2018), while revenue generated from gorilla visits in Volcanoes National Park, Rwanda, has supported up to 90% of park activities (APN, 2021). Furthermore, such tourism activities create employment opportunities for surrounding communities, highlighting the potential socio-economic benefits (Visit Rwanda, 2021).

Despite Cameroon's immense touristic potential, it remains largely underdeveloped and undervalued (Frida-Tolonen, 2014). Several factors, including unprofessional guide staff, inadequate infrastructure, poor marketing, and security concerns, contribute to the underutilization of tourism opportunities (Kimbu, 2011; Frida-Tolonen 2014). Notably, visitors have shown a greater interest in ex-situ conservation sites like MWS, the Mvog-beti zoo in Yaoundé, and the Limbe botanic garden (Nlom et al., 2013). However, it is crucial to assess their willingness to visit and experience natural ecosystems within Cameroon's national parks, along with the necessary conditions and the amount they are willing to spend for such visits. This data can inform conservation stakeholders in creating suitable conditions to attract more tourists and generate funds for the sustainable management of PAs.
Previous studies have emphasized the significance of socioeconomic factors in shaping visitors' attitudes, preferences, and behaviors towards wildlife conservation and ecotourism (Hvenegaard, 2017; Nyaupane et al., 2018). The willingness to pay (WTP) approach has been widely employed to evaluate visitors' monetary valuation of wildlife experiences and assess the potential for generating financial resources to support protected area management (Ginsburgh, 2017; Schläpfer et al., 2016).

This study aims to contribute to the existing body of knowledge by specifically investigating the socioeconomic determinants that influence Mefou Wildlife Sanctuary visitors' WTP for observing animals in the Cameroon national parks. By exploring the key factors that shape visitors' preferences and behaviors, the findings of this research can inform the development of targeted strategies for sustainable funding, effective conservation management, and enhanced visitor experiences within protected areas (Reimer et al., 2020; Biggs et al., 2020). Specifically, this study is focusing on i) identifying tourists visiting the MWS, ii) evaluating their willingness and their conditions to see wildlife species in their natural habitat (national parks) and iii) determining the amount they are willing to spend for such experiences.

2. Methodology

2.1. Study area

The Mefou Wildlife Sanctuary (MWS) was specifically chosen as the study area for this research due to its significance and characteristics. It serves as an ex-situ conservation site and has garnered substantial attention, with over 6,800 visitors in 2013, making it the third most frequented eco-tourist destination in Cameroon, particularly popular among foreign visitors (Doumenge et al., 2021). The sanctuary spans a total area of approximately 800 hectares, yet only around 60 hectares have been effectively utilized and developed. Geographically, it is situated in the Centre region of Cameroon, within the Mefou-and-Afamba Division, Mfou Subdivision, encompassing the villages of Ekali I, Ekali II, and Metet (Figure 1) at coordinates 3°57'09"N and 11°55'20"E.

The management of MWS is entrusted to the NGO Ape Action Africa, which primarily focuses on primate conservation within the sanctuary, an aspect that captivates a significant number of visitors, along with the diverse flora species found in the forest. The sanctuary is home to a remarkable primate population, comprising 287 apes, all of which are orphans, including 125 chimpanzees, 24 gorillas, and 138 monkeys representing 10 different species. The animals are
housed in enclosures, each covering an area of approximately 2 hectares, featuring natural
vegetation such as large trees and various flora species that closely resemble the natural habitat of apes (Maurice et al., 2020). To ensure the well-being of the animals, each enclosure is overseen by a team of at least three animal caregivers who diligently attend to their feeding, hydration, and overall health, while also monitoring their behavior for any signs of illness or negative changes. The valuable insights and observations provided by these caregivers contribute to the feedback and reporting process to the Ministry of Forestry and Wildlife, facilitating effective management practices within the sanctuary.

Fig 1. Location of the Mefou Wildlife Sanctuary (MWS)

The MWS is conveniently situated a mere 45 km from Yaoundé, the capital city of Cameroon. To enter the sanctuary, visitors are required to pay an entrance fee. For adult foreigners, the fee is set at FCFA 10,000 (US$ 16), while resident foreigners are charged FCFA 7,500 (US$ 12). Foreign children are admitted at FCFA 4,000 (US$ 7), whereas adult Cameroonians pay FCFA 2,000 (US$ 6), and national children are granted entry for FCFA 500 (US$ 0.8). These fee
structures serve as an indication that visitors possess a genuine interest and passion for wildlife conservation prior to their arrival at the sanctuary.

Within the MWS, the apes are housed in enclosures that span up to two hectares, featuring the presence of natural, towering trees. This arrangement provides visitors with a vivid glimpse into the habitat and lifestyle of these apes in their natural surroundings (Wamba et al., 2022). The sanctuary offers two visitation sessions per day, the morning session taking place from 9 am to 11 am, and the afternoon session occurring between 2 pm and 4 pm. To ensure an optimal experience, each session is limited to a maximum of 20 individuals.

2.2. Data collection

In order to assess the willingness of visitors to pay visits to protected areas (PAs), a socio-economic survey was conducted among individuals visiting the MWS. The survey took place from March to April 2022 and involved a representative sample of 637 respondents from the 257 visitor groups that toured the MWS during that period. Following their visit, the respondents were undertaken a semi-structured questionnaire to gather information following the contingent valuation approach (Ginsburgh, 2017).

The questionnaire encompassed various aspects, including the visitors' satisfaction with the visit, their awareness of where they could observe the animals in their natural habitat, the expenses incurred during their trip, their willingness to witness the animals in the wild, the amount they were willing to spend for such an excursion, and whether they would be willing to pay additional fees to observe iconic species such as elephants, leopards, and crocodiles. Furthermore, general inquiries were made concerning the respondents' demographic characteristics, such as their gender, age, monthly income, place of origin, how they learned about the MWS, the frequency of their visits to PAs, and their level of education. Table 1 provides an overview of the respondents' sociological characteristics, encompassing their gender, age, nationality, and education level.
Table 1. Sociological characteristics of the respondents

<table>
<thead>
<tr>
<th>Sociological Feature</th>
<th>Category</th>
<th>Number of 167 respondents</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>392</td>
<td>61.6</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>245</td>
<td>38.4</td>
</tr>
<tr>
<td>Origin</td>
<td>National</td>
<td>189</td>
<td>29.6</td>
</tr>
<tr>
<td></td>
<td>Foreigner</td>
<td>448</td>
<td>70.4</td>
</tr>
<tr>
<td>Age</td>
<td>10-20</td>
<td>25</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>20-30</td>
<td>112</td>
<td>17.6</td>
</tr>
<tr>
<td></td>
<td>30-40</td>
<td>331</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>40-50</td>
<td>102</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>50-60</td>
<td>67</td>
<td>10.4</td>
</tr>
<tr>
<td>Education</td>
<td>Primary</td>
<td>15</td>
<td>2.3</td>
</tr>
<tr>
<td></td>
<td>Secondary</td>
<td>203</td>
<td>31.9</td>
</tr>
<tr>
<td></td>
<td>University</td>
<td>419</td>
<td>65.8</td>
</tr>
</tbody>
</table>

2.4. Data analysis

The data collected during the survey were entered into Microsoft Excel for encoding and subsequently analyzed using R software, version 4.1.1 (R Core Team 2022). To assess the respondents' willingness to observe wildlife in its natural habitat, the Chi-Square test of independence in conjunction with the Fisher test was employed as suggested by (McHugh, 2013). This statistical analysis aimed to determine whether any associations existed between the respondents' willingness (yes or no) and their sociological characteristics, including origin, gender, education level, age, and monthly income.

The contingent valuation method was used to estimate visitors' willingness to pay for observing wildlife in its natural habitat (Ginsburgh, 2017). Then, the analysis of variance (ANOVA) and mean separation through Tukey's HSD (Honestly Significant Difference) were utilized. These statistical techniques facilitated the comparison of results across each of the sociological features mentioned earlier, namely origin, gender, education level, age, and monthly income.

3. Results

3.1. Identification of eco-tourist at the Mefou Wildlife Sanctuary (MWS)

3.1.1. Number of visitors of the MWS

Among the 637 respondents who visited the Mefou Wildlife Sanctuary (MWS) throughout the study period, 331 were Cameroonian, accounting for 52% of the total visitors, while 306 were foreigners from various countries, representing 48% of the total visitors (refer to Table 2 for detailed statistics). Notably, the category with the highest number of visitors was foreign men,
whereas the category with the lowest number was foreign children. This disparity in visitor demographics can be attributed to the fact that many foreign visitors were accompanied by male drivers or guides who were nationals. Additionally, the relatively high number of national children visiting the sanctuary was influenced by the participation of four schools, which brought a total of 104 students for an educational excursion.

Table 2. Origin of visitors at the Mefou Wildlife Sanctuary

<table>
<thead>
<tr>
<th>Gender</th>
<th>National visitors</th>
<th>Foreign visitors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percentage</td>
</tr>
<tr>
<td>Male</td>
<td>130</td>
<td>20.4</td>
</tr>
<tr>
<td>Female</td>
<td>66</td>
<td>10.4</td>
</tr>
<tr>
<td>Children</td>
<td>135</td>
<td>21.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>331</strong></td>
<td><strong>52</strong></td>
</tr>
</tbody>
</table>

The total amount collected in entrance fees during the two-month period amounted to FCFA 3.2 million (US$ 5,195), with foreign visitors contributing FCFA 2.7 million (US$ 4,383) and national visitors contributing FCFA 0.5 million (US$ 812). Additionally, the Mefou Wildlife Sanctuary's eco shop generated sales of approximately FCFA 1,800,000 (US$ 2,922) within the same timeframe.

3.1.2. Nationality and monthly income of the visitors

Out of the 637 interviewed visitors, there was a diverse range of nationalities represented. Most visitors at the Mefou Wildlife Sanctuary (MWS) were Cameroonian, with 188 individuals accounting for 29.6% of the total number of visitors. Foreign visitors came from various regions including Europe, America, Asia, and other African countries. Among the foreign visitors, France had the highest number with 127 visitors (20%), followed by England with 56 visitors (8.8%). Germany and the USA each had 40 visitors (6.4%), while Belgium and Spain had 30 visitors each (4.8%). Israel and Italy had 20 visitors each (3.2%), and several countries including Algeria, Senegal, India, Poland, and Switzerland had 10 visitors each (1.6%). Additionally, Canada, Rwanda, Mexico, Portugal, Sweden, and Slovenia each had five visitors (0.8%). Figure 2 showcases the average monthly income of visitors based on their origin (national or foreigner).
Fig. 2. Average monthly income of visitors

The average monthly income of national visitors was approximately FCFA 500,000 (US$ 812), ranging from a minimum of FCFA 100,000 to a maximum of FCFA 900,000. For foreign visitors, the average monthly income was about FCFA 1.3 million (US$ 2,110), with a minimum of approximately FCFA 900,000 (US$ 1,475) and a maximum of FCFA 1.7 million (US$ 2,786).

3.1.3. Proportion of resident and the city of visitors

The findings indicate that the vast majority (90%) of the visitors to the MWS are residents of Cameroon, visiting the sanctuary primarily for leisure purposes. Only 10% (63 individuals) of the visitors are classified as tourists who have traveled from other countries specifically to explore Cameroon. In this context, "resident" refers to individuals who are in Cameroon for reasons other than tourism, such as work, assignments, or health-related matters.

The survey also revealed that approximately 90.4% (576 individuals) of the visitors originated from a single city, namely Yaoundé, the capital city. This city is located just 45 km away from the MWS, making it easily accessible. This high proportion can be attributed to the presence of various embassies and the headquarters of international NGOs in Yaoundé. Moreover, since much of the information about the MWS spreads through word of mouth, it is understandable that most of visitors come from the same city.

Among the other cities surveyed, Douala, the second-largest city with nearly 4 million inhabitants, accounted for only 21 visitors, despite being located 337 km away from the MWS. Similarly, only 20 visitors came from Mbalmayo, a significant city with over 120,000 residents.
suggested just 25 km from the sanctuary. Additionally, only 10 visitors originated from Metet, a
village within the MWS. Interestingly, no visitors were recorded from Ebolowa, the capital city
of the South region, which has a population of over 250,000 and is located just 135 km from
the MWS.

**Table 3. Provenance city of visitors**

<table>
<thead>
<tr>
<th>City</th>
<th>number of visitors</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yaounde</td>
<td>576</td>
<td>90.4</td>
</tr>
<tr>
<td>Douala</td>
<td>21</td>
<td>3.3</td>
</tr>
<tr>
<td>Mbalmayo</td>
<td>20</td>
<td>3.1</td>
</tr>
<tr>
<td>Metet</td>
<td>10</td>
<td>1.6</td>
</tr>
<tr>
<td>Kribi</td>
<td>5</td>
<td>0.8</td>
</tr>
<tr>
<td>Lobeke</td>
<td>5</td>
<td>0.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>637</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

**3.1.4. Source of information about the sanctuary**

According to the survey results, a significant proportion of visitors (86%) obtained information
about the MWS through personal connections, primarily from relatives. This "word-of-mouth"
method involved friends, family members, neighbors, or colleagues who had previously visited
the MWS. On the other hand, only a minority (14%) relied on online advertisements, including
various platforms such as websites and social media channels like Facebook, Instagram, or
TikTok.

Furthermore, the survey revealed that a majority of visitors (91% or 579 individuals) expressed
satisfaction with their experience at the MWS. Many visitors were particularly impressed by
the presence of great apes and monkeys, while others expressed delight in witnessing a tropical
forest with its majestic large trees and hanging lianas. However, a small proportion of visitors
(9%) reported some level of dissatisfaction. Although they enjoyed observing the apes, they
had expected to encounter a wider variety of wildlife species during their visit.

**3.2. The willing to see wildlife species in their natural habitat**

The level of visitor interest in wildlife was initially assessed by analysing their frequency of
visits to the MWS. Figure 3 presents the distribution of the number of times visitors have come
to the sanctuary. It is evident that the majority of visitors, accounting for 81.6% (520
individuals), have visited the MWS only once. This could be attributed to the perception that
there are limited species to observe during a single visit, leading to the belief that subsequent
visits may not offer anything significantly new or different. However, a small percentage of
visitors, 9.6%, have visited twice, 7.2% have visited thrice, while 0.8% have visited for the fifth time and another 0.8% have visited for the tenth time.

![Pie chart showing frequency of visitors](image)

**Fig 3. Frequency of visitors**

The visitors' inclination to observe wildlife in their natural habitat is presented in Table 4, categorized by their sociological characteristics. The table reveals that an overwhelming majority of visitors, 98%, express a willingness to see animals in the wild based on their sociological features. In terms of gender, all female visitors express this desire, while only three males are not interested. Almost all foreign visitors are willing, with the exception of one who remains skeptical, along with two national visitors. Among the age groups, two visitors from the 20-30 age group and one visitor from the 40-50 age group do not wish to witness wildlife species in the wild. Conversely, all visitors from the 10-20, 30-40, and 50-60 age groups express a desire to observe these wildlife species in their natural habitat.

Furthermore, all visitors with low monthly incomes (less than FCFA 0.5 million) and high incomes (above FCFA 1.5 million) are willing to see wildlife in their natural habitat. However, three visitors with monthly incomes ranging from FCFA 0.5-1 million do not share the same willingness.

A total of 622 out of the 637 interviewed visitors (98%) express their willingness to observe apes in their natural habitat. The statistical analyses, including the Chi-Square (X2) test and Fisher tests, indicate that the willingness to see wildlife species is dependent on the respondents' sociological characteristics (gender, origin, age, education, and average monthly income) with p values above 0.05.
Table 4. Comparing willingness to see with sociological characteristics of visitors

<table>
<thead>
<tr>
<th>Sociological feature</th>
<th>Category</th>
<th>No</th>
<th>Yes</th>
<th>Chi-Square (X²)</th>
<th>Fisher Test (P-value)</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Female</td>
<td>0</td>
<td>245</td>
<td>1.85</td>
<td>0.17</td>
<td>0.29</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>15</td>
<td>377</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Origin</td>
<td>Foreigner National</td>
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<td>443</td>
<td>2.02</td>
<td>0.15</td>
<td>0.21</td>
</tr>
<tr>
<td></td>
<td>National</td>
<td>10</td>
<td>179</td>
<td></td>
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<td></td>
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<tr>
<td>Age</td>
<td>0-20</td>
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<td>25</td>
<td>6.82</td>
<td>0.14</td>
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<td>50-60</td>
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<tr>
<td>Education</td>
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<td>0.29</td>
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<tr>
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<td>Tertiary</td>
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<td>418</td>
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<td>Average monthly income (*FCFA)</td>
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<td>133</td>
<td>3.48</td>
<td>0.32</td>
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<td>500-1000</td>
<td>7</td>
<td>153</td>
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<td>1000-1500</td>
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<td></td>
<td>1500+</td>
<td>0</td>
<td>178</td>
<td></td>
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</tbody>
</table>

No= Number of No (unwilling to see); Yes=Number of Yes (willing to see)

On the topic of awareness about other Protected Areas (PAs) where wildlife can be observed in their natural habitat, approximately 78% (499 individuals) of the visitors were unaware of any PAs. In contrast, 22% (138 individuals) were familiar with at least one PA. Among those who mentioned specific PAs, 41 visitors referred to the Dja Wildlife Reserve, 36 mentioned Waza National Park, 26 were aware of Lobéke National Park, 20 knew about Douala-Edea National Park, 15 mentioned Campo-Ma'an National Park, 10 talked about Mengeme, 6 individuals mentioned Korup National Park, and 5 individuals were familiar with Benoué National Park.

3.3. Amount tourists are willing to spend to see wildlife species in their natural habitat

Moving on to the amount of money tourists are willing to spend to observe wildlife species in their natural habitat, Table 5 provides a summary based on their sociological characteristics. This amount includes the entrance fee, lodging, and logistics on-site. The ANOVA test reveals a significant difference between the various categories of each sociological feature in terms of their willingness to pay (WTP). Specifically, male visitors express a willingness to spend an average of up to FCFA 100,000 ($US 162), while women are not willing to spend more than FCFA 70,000 ($US 114). Foreign visitors are willing to spend an average of FCFA 105,000 ($US 170), while nationals' average amount is limited to FCFA 50,000 ($US 81) to observe wildlife species in their natural habitat.
Table 5. The amount visitors are willing to pay to see apes in the wild

<table>
<thead>
<tr>
<th>Sociological feature</th>
<th>Category</th>
<th>N</th>
<th>Mean ± sd (FCFA 1000)</th>
<th>ANOVA F value</th>
<th>Pr(&gt;F)</th>
<th>Sig.</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Female</td>
<td>245</td>
<td>72.2±51.5</td>
<td>4.45</td>
<td>0.04</td>
<td>0.05</td>
<td>Significantly different</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>392</td>
<td>99.1±77.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Origin</td>
<td>Foreigner</td>
<td>448</td>
<td>105.7±67.4</td>
<td>19.49</td>
<td>0.2*10⁻⁴</td>
<td>0.001</td>
<td>Significantly different</td>
</tr>
<tr>
<td></td>
<td>National</td>
<td>189</td>
<td>49.3±49.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>10-20</td>
<td>25</td>
<td>19.0±8.9</td>
<td>2.16</td>
<td>0.07</td>
<td>0.01</td>
<td>Significantly different</td>
</tr>
<tr>
<td></td>
<td>20-30</td>
<td>112</td>
<td>73.9±53.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>30-40</td>
<td>331</td>
<td>93.1±66.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>40-50</td>
<td>102</td>
<td>91.9±84.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>50-60</td>
<td>67</td>
<td>116.5±86</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>Primary</td>
<td>15</td>
<td>30.0±17.3</td>
<td>1.09</td>
<td>0.33</td>
<td>0.01</td>
<td>Significantly different</td>
</tr>
<tr>
<td></td>
<td>Secondary</td>
<td>203</td>
<td>90.7±81.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tertiary</td>
<td>419</td>
<td>90.3±64.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AMI (FCFA 1000)</td>
<td>40-500</td>
<td>133</td>
<td>42.9±41.4</td>
<td>9.30</td>
<td>0.1*10⁻⁴</td>
<td>0.001</td>
<td>Significantly different</td>
</tr>
<tr>
<td></td>
<td>500-1000</td>
<td>160</td>
<td>70.3±58.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1000-1500</td>
<td>166</td>
<td>111.5±77.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1500+</td>
<td>178</td>
<td>118.6±67.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

n=number of respondents; sd=standard deviation; ANOVA=analysis of variance; sig.= level of significance; AMI=average monthly income; Values followed by different letters (a, b, and c) in the same column and line block are significantly different at p≤0.05

Moreover, concerning the respondents’ age, there is a gradual increase in the average amount they are willing to pay based on their age group. The youngest age group (10-20 years old) has an average WTP of FCFA 19,000 ($US 31), while the oldest age group (50-60 years old) is willing to spend FCFA 116,000 ($US 188). The mean separation test indicates a significant difference between the amount that the 10-20 years old category is willing to spend compared to the other categories, which exhibit similar levels of willingness. Similarly, visitors with a primary level of education have a significantly lower average WTP, with FCFA 30,000 ($US 49), compared to visitors with secondary and tertiary education levels, both willing to spend FCFA 90,000 ($US 146) to observe wildlife in the wild.

Furthermore, the average monthly income also plays a role in influencing the WTP, as the willingness increases proportionally with monthly income. Visitors with a low average monthly income (less than FCFA 1 million) are willing to spend up to FCFA 70,000 ($US 114), which is statistically lower than the FCFA 110,000 ($US 179) that those earning 1.5 million are willing to pay to see animals in their natural habitat.

When asked if they would be willing to pay more, 70% of visitors express their WTP a higher amount to observe a greater variety of iconic species such as elephants, lions, giraffes, leopards,
478 crocodiles, and buffaloes, in addition to apes. For the remaining 30% of visitors, the amount
479 they are willing to pay to see apes represents the maximum they can afford for an eco-touristic
480 trip.
481
482 4. Discussion
483
484 4.1. Identification of tourists of the MWS
485 During the two-month study period, a total of 637 visitors were recorded at the MWS, with
486 48% being foreigners and 52% being nationals. This translates to approximately 3,816 visitors
487 annually. These findings are lower than those reported by Nlom et al. (2013) who recorded
488 6,800 visitors at the MWS in 2012, with 70% being foreigners and 30% being nationals. The
489 difference can be attributed to the fact that the present study was conducted shortly after the
490 COVID-19 pandemic, during which all tourism activities were significantly impacted.
491 Additionally, this result is significantly lower than the visitor numbers reported at other ex-situ
492 conservation sites according to the same study by Nlom et al., (2013). For instance, the Mvog-
493 beti Zoo and the Limbe Botanic Garden in Cameroon received 69,985 and 50,372 visitors,
494 respectively, in 2012, with 1.2% and 7.8% of foreigners, respectively. This difference can be
495 attributed to their locations in major cities like Yaoundé and Limbe, the wide variety of species
496 they offer, and their low entrance fees of FCFA 1,000 ($US 1.6).
497
498 The number of visitors in this study is considerably higher compared to natural conservation
499 sites, where the annual visitor numbers in 2012 were 2,930 for Waza National Park, 1,107 for
500 Mount Cameroon National Park, 496 for Benoue National Park, 148 for Campo Ma’an National
501 Park, and 82 for the Dja Wildlife Reserve in Cameroon (Nlom et al., 2013). This difference
502 may be attributed to the fact that in ex-situ conservation sites in Cameroon, visitors are
503 guaranteed to see wildlife species, which is not always the case in natural protected areas.
504 Additionally, limited knowledge about national parks is evident, as 78% of visitors in this study
505 were unaware of any protected area where they could observe wildlife species.
506
507 Foreign visitors primarily originated from France (20% of visitors), followed by England
508 (8.8%) and Germany (6.4%). This can be attributed to historical colonial ties and the existing
509 cooperation between Cameroon and these countries, which encourage citizens to visit
510 Cameroon (Mabeu et al., 2023) This result differs from the tourist profile in Uganda, where
511 about three-quarters of tourists come from other African countries, with Kenya accounting for
512 more than 50%, followed by Tanzania and Rwanda (MTWA, 2014). This can be attributed to
513 the strong wildlife tourism culture in East African countries and the ease and affordability of
travel between these nations (Nibigira, 2019). Therefore, the Cameroonian government and
private sector should invest in tourist infrastructure such as roads, hotels, and restaurants in and
around protected areas, making them more appealing destinations for international tourists.
Additionally, increased advertising of Cameroon's significant tourist potential is crucial.

Effective advertising campaigns should target Europeans, Americans, Asians, and Africans,
utilizing both conventional and social media platforms. For example, in Rwanda's Volcano
National Park, during the "Kwita Izina 2022" Gorilla naming ceremony, more than 1,000
foreign tourists were in attendance (Visit Rwanda, 2022). This success can be partly attributed
to extensive advertising through the "Visit Rwanda" campaign, which is promoted across
various online platforms such as Google, YouTube, Facebook, TikTok, Instagram, and others,
showcasing the potential of Rwanda's protected areas. Consequently, tourists are able to make
online bookings to visit Rwanda, inspired by these success stories.

4.2. The willingness to see wildlife species in their natural habitat

The majority of visitors (91%) reported being satisfied with their tour, although 81.6% were
visiting for the first time. Visitors were satisfied because they had the opportunity to see various
groups of animals. However, the overall touristic potential is not sufficient to encourage many
visitors to repeat the trip. According to Doumenge et al. (2021), having a single "flagship"
touristic product is not enough. Tourism thrives on the diversity of offerings at each site, within
each country, and across sub-regions. Therefore, to attract tourists on a long-term basis,
multiple touristic products or destinations should be associated. A touristic circuit could be
created, linking several protected areas so that tourists can have multiple experiences during
their visit.

The results indicate that 78% of visitors were unaware of any protected areas where they could
observe wildlife species in Cameroon. This lack of knowledge is due to the poor advertisement
of eco-touristic sites, with limited efforts made by protected area managers in Cameroon. For
example, very few protected areas have active social media pages on platforms such as
YouTube, Facebook, Instagram, and TikTok. This limited promotion contributes to the low
number of tourists these areas receive annually, often less than 100. This finding contrasts with
the work of Peet et al., (2016) conducted at Kruger National Park in South Africa. SANparks,
responsible for the advertisement of all national parks in South Africa, actively promoted
Kruger National Park on various online platforms such as Facebook and Instagram, regularly
showcasing its touristic potential. This contributed to attracting over one million tourists in
2016. Therefore, each protected area in Cameroon should establish an active online presence to
showcase the species that can be observed by tourists if they visit.

The analysis of visitor willingness to observe wildlife species reveals that 98% of visitors
expressed a desire to observe these species in their natural habitat. This finding aligns with the
research by Zyndron et al. (2021), which found that the vast majority of society expressed their
willingness to visit and support Wielkopolski National Park in Poland. This passion for wildlife
species among eco-tourists drives their desire to witness firsthand how these species interact
with each other, other species, and their environment, despite the wild nature and associated
risks. Additionally, many visitors understand the importance of their contribution to the
protected area's income and its impact on the conservation of wildlife species. However, despite
their willingness, only a few have had the opportunity to visit protected areas in Cameroon due
to limited access and a lack of information about where to observe these species. Moreover,
there are few success stories from those who have visited protected areas in Cameroon. For
instance, Germain, a French visitor to the MWS, mentioned that he visited Campo-Ma'an
National Park but did not have the opportunity to see any animals.

4.3. The amount visitors are willing to pay to see wildlife species in their natural habitat

The findings reveal that foreign visitors are willing to pay an average of FCFA 105,000, while
nationals are willing to pay only FCFA 50,000 to see apes in their natural habitat. Rachelle, an
American visitor to the MWS, stated, "I am ready to pay US$1,500 if I am sure to see these
great apes because that's what people pay in Rwanda." Similarly, Brighton, a British visitor,
expressed, "Money is not a problem; I am willing to pay any amount if the park can assure
comfort in terms of lodging, logistics, and the opportunity to see iconic species in the wild."
This aligns with the economic model of entrance fees in Volcano National Park in Rwanda,
where foreign tourists pay higher fees compared to regional and national tourists. In response
to the international tourism crisis caused by the Covid-19 pandemic, temporary entrance fees
for foreign international tourists were set at $US 1,500 (FCFA 750,000), $US 500 (FCFA
250,000) for residents and tourists from the African Union, and $US 200 (FCFA 100,000) for
national tourists and the East African community (Visit Rwanda, 2021). This is due to the higher
financial capacity of foreigners in many African countries (IMF 2022), and their passion and
eagerness to see these wildlife species in their natural habitat, as they are not commonly found
in their home countries (Karam, 2020). Therefore, if they are guaranteed the opportunity to see
these species, they are willing to pay.
The results also indicate that older visitors (50-60 years) are willing to spend more than younger visitors. This can be attributed to older visitors having more leisure time and a greater understanding of the importance of these wildlife species. This finding aligns with Zyndron et al. (2021) research, which found that older individuals, particularly those over 60, expressed the highest willingness to bear financial costs for the benefit of Wielkopolski National Park in Poland. Respondents in the 41-60 age group also declared large amounts. Conversely, the age group least likely to incur expenses for the park comprised individuals aged 26-40. Therefore, when developing touristic infrastructure in and around protected areas, logistics, transportation, and catering should consider the needs of older people, as they are more likely to visit if the conditions are suitable for them. Additionally, men are willing to pay significantly more than women, as men tend to spend more time and money on leisure activities (Bruce, 2013). Hence, advertisement efforts can focus on men to encourage them to bring their families.

Furthermore, visitors with a primary level of education are willing to pay significantly less than those with secondary and tertiary levels. This finding aligns with Sintayehu (2020) study, which indicated that WTP was positively influenced by education, suggesting that increased years of education would enhance visitors' WTP. Witt (2019) also emphasized that education and awareness have a positive impact on personal growth and can increase knowledge, ultimately leading to more positive environmental attitudes.

The results also reveal that wealthier visitors are willing to pay more than those with lower incomes. This can be explained by the fact that wealthier individuals have greater financial means to support their touristic activities. This finding aligns with Zyndron et al. (2021) research, which showed a clear correlation between wealth and the willingness to financially support Wielkopolski National Park in Poland. The group with the lowest monthly income per family member was less likely to incur financial costs compared to those with higher incomes. The findings of Nie et al. (2019) also support the notion that visitation is income elastic, and the demand for ecotourism is highly influenced by household income and the overall wealth of the nation.

In summary, this study underscores the untapped potential of eco-tourism in Cameroon, particularly. By capitalizing on the diverse wildlife, creating appealing touristic circuits, improving advertising efforts, and addressing visitor preferences, Cameroon and other Congo basin countries can position themselves as attractive destinations for eco-tourists from around the world. Through responsible and sustainable tourism practices to value protected areas, the
countries can simultaneously contribute to funding biodiversity conservation, support local communities, and enhance its tourism industry for the long term.

**Conclusion**

This study sheds light on various socioeconomic factors affecting Mefou Wildlife Sanctuary (MWS) visitors' willingness to pay (WTP) for wildlife species observation in national parks. It reveals the current state of visitor demographics, satisfaction levels, willingness to see wildlife species in their natural habitat, and the amount visitors are willing to pay for this unique experience. The findings emphasize the need for strategic planning and promotion of eco-touristic sites in Cameroon. While visitor satisfaction levels are high, the study highlights the importance of diversifying the touristic offerings and creating touristic circuits that connect multiple protected areas. This approach would allow visitors to have a range of experiences and encourage repeat visits, ultimately boosting tourism revenue and conservation efforts. One crucial aspect that requires attention is the limited awareness among visitors regarding the existence of other protected areas where wildlife species can be observed in the wild. It is essential for park managers to enhance their advertising efforts, particularly through active engagement on various social media platforms, as demonstrated by successful examples from other countries. The study also highlights the significant role of visitor WTP, particularly among foreign visitors. The findings suggest that foreign tourists are willing to pay higher fees, reflecting their enthusiasm to witness iconic wildlife species in their natural habitats. This can generate increased revenue that can be reinvested in conservation efforts and improving the overall tourist experience. Furthermore, the study reveals that age, gender, education level, and income play a role in visitor preferences and WTP. Understanding these factors can guide the development of tailored marketing strategies and touristic infrastructure to cater to different visitor segments, such as targeting older individuals, emphasizing educational outreach, and considering the needs and preferences of wealthier tourists to become attractive destination for eco-tourists from around the world. By effectively showcasing the rich biodiversity and unique wildlife experiences, Cameroon can attract both international and domestic tourists, contributing to the country's tourism industry and conservation goals while supporting local development.

**Competing Interests**

The authors report there are no competing interests to declare.
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