SUSTAINABLE ECOTOURISM IMPLEMENTATION STRATEGY USING MULTIDIMENSIONAL SCALING ON THREE DESTINATIONS IN THE GAMBIA, WEST AFRICA

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SUSTAINABLE ECOTOURISM IMPLEMENTATION STRATEGY USING MULTIDIMENSIONAL SCALING ON THREE DESTINATIONS IN THE GAMBIA, WEST AFRICA. This study aims to analyze the sustainability of three existing ecotourism destinations in the Gambia: (a) Bijilo Monkey Forest, (b) Maka Sutu Cultural Forest, and (c) the River Gambia National Park in the Gambia, West Africa, and postulate a sustainable policy strategy based on the outcome of the analysis through questionnaires, observations, and interviews. A mixed research method using Multidimensional Scaling (MDS) and Analytical Hierarchy Process (AHP) was employed to determine the sustainability status of ecotourism based on five dimensions: ecological/conservation, participation, education and recreation, economic, and control/legislation. The multidimensional sustainability index of the three destinations under study is 69.03%, 64.49%, and 54.94% for River Gambia National Park, Maka Sutu Cultural Forest, and the Bijilo Monkey Forest, respectively. This study concluded that all the sites under study are classified as sustainable. However, the community participation dimension needs improvement for fair and equitable distribution of natural resource wealth.

Keywords: Ecology; economy; ecotourism; society; sustainability

STRATEGI IMPLEMENTASI EKOWISATA BERKELANJUTAN DENGAN MENGGUNAKAN SKALA MULTIDIMENSI PADA TIGA DESTINASI DI GAMBIA, AFRIKA BARAT. Penelitian ini bertujuan untuk menganalisis keberlanjutan tiga destinasi ekowisata yang ada di Gambia: (a) Hutan Monyet Bijilo, (b) Hutan Budaya Maka Sutu, dan (c) Taman Nasional Sungai Gambia di Gambia, Afrika Barat, serta merumuskan strategi kebijakan yang berkelanjutan berdasarkan hasil analisis melalui kuesioner, pengamatan, dan wawancara. Metode penelitian campuran menggunakan Multi-Dimensional Scaling (MDS) dan Analytical Hierarchy Process (AHP) digunakan untuk menentukan status keberlanjutan ekowisata berdasarkan lima dimensi: ekologi/konservasi, partisipasi, pendidikan dan rekreasi, ekonomi, dan kontrol/perundang-undangan. Indeks keberlanjutan multidimensi dari tiga destinasi yang diteliti adalah 69,03%, 64,49%, dan 54,94% untuk Taman Nasional Sungai Gambia, Hutan Budaya Maka Sutu, dan Hutan Kera Bijilo. Penelitian ini menyimpulkan bahwa semua lokasi yang diteliti diklasifikasikan sebagai berkelanjutan. Namun demikian, dimensi partisipasi masyarakat masih perlu ditingkatkan untuk distribusi kekayaan sumber daya alam yang adil dan merata.

Kata kunci: Ekologi; ekonomi; ekowisata; masyarakat; keberlanjutan

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I. INTRODUCTION

Ecotourism is a vital component of sustainable development, promoting responsible travel to natural areas while conserving the environment and improving the well-being of local communities. As the global demand for ecotourism experiences rises, the effective implementation of ecotourism initiatives becomes crucial for maximizing benefits and minimizing negative impacts. One innovative approach to assess and enhance the implementation of ecotourism is the use of Multi-Dimensional Scaling (MDS) and Rapid Assessment of Fisheries (RAPFISH) – an adaptation for assessing various tourism contexts (Sambou et al., 2019; Rinawati et al., 2019; Klein et al., 2017). MDS is a statistical technique that visualizes the similarities or differences among data points in a multi-dimensional space. In the context of ecotourism, it allows stakeholders to represent complex relationships among various factors—such as environmental impact, socio-economic benefits, and stakeholder satisfaction in a comprehensible manner. RAPFISH complements this by providing a framework for assessing and communicating the performance of ecotourism initiatives based on multiple criteria, making it easier to identify areas for improvement, and the Analytical Hierarchy Process (AHP) enables better, more effective and efficient policy strategy development (Pitcher & Preikshot, 2001; Nurhabib et al., 2024). Combining the two approaches bridges mixed research methodology where qualitative and quantitative information is utilized.

Integrating MDS and RAPFISH (MDS-RAPFISH) in ecotourism implementation facilitates systematically evaluating existing practices and policies. It enables stakeholders—including government agencies, local communities, and tour operators—to collaboratively assess their performance in terms of sustainability, community involvement, and ecological integrity. By visualizing data in a multidimensional space, decision-makers can prioritize actions that enhance the sustainability of ecotourism while fostering local development (Pitcher et al., 2013; Parmawati et al., 2019). This research explores the application of MDS-RAPFISH in assessing the sustainability index of ecotourism implementation in selected destinations in the Gambia. It will analyze the sustainability of the five dimensions under study and the limitations and provide recommendations for practitioners looking to enhance their ecotourism practices. By employing MDS RAPFISH, stakeholders can better understand the complexities of ecotourism and work towards sustainable and effective implementation strategies that benefit both the environment and local communities. (Chaliluddin et al., 2023; Nurhabib et al., 2024)

Regarding the implementation of ecotourism, no research holistically looked at the sustainability of ecotourism practice in the Gambia. The practice depends entirely on destination owners, which can lead to irreversible ecological damage and social conflict without community participation. There is a rapid proliferation of real estate, leading to high land-use change. Most policy development in the country is not based on empirical scientific evidence; therefore, there is need for science-based policy development. Most researchers focus on environmental sustainability and socio-cultural or economic dimensions (Hakim et al., 2008, 2009). Some researchers on ecotourism in The Gambia argued that sustainability is a major concern for the sector due to poor implementation leading to environmental depletion, wildlife disturbance, and infrastructural damage (Jones, 2005).

In this research, we chose the three most popular destinations in the country managed by different stakeholders. There is no methodological monocropping; therefore, different approaches are used to avoid biases and potential errors or omissions to (a) analyze the index of sustainability of each dimension under study on the ecotourism sites. (b) to analyze the sensitivity of sustainability of each dimension in each destination and (c) the formulation of a sustainable ecotourism

policy in The Gambia. Ecotourism practice across jurisdictions varies due to demography, legislature, culture, spirituality, and ecological characteristics.

Ecotourism destinations' sustainability depends on different factors such as laws and regulations, awareness level and environmental consciousness, community participation, and spirituality (Sambou et al., 2019). However, these factors play out differently in different destinations. Population increases, economic growth, migration and urbanization, and land use or natural geomorphic changes are challenges to the sustainability of natural resources, particularly ecotourism destinations (IPCC, 2014). Ecotourism management includes many things: observation at local and global levels, maintaining natural resource wealth, culture, and heritage, management in terms of environmental conservation, waste management, use of sources, and the sustainable utilization of the existing sites. In some destinations, the term ecotourism is widely used to attract tourists. It is often a hoax than reality. Ecotourism is the most rapidly growing sector in the global tourism industry (Hakim et al., 2008, 2009; Sambou et al., 2019). The sustainability of the tourism industry has become a research interest for many scholars over the years. Sustainability is simply meeting the needs of our generation without compromising the needs of the future generation (WCED, 1987). Applying this definition to real life, there is a need for integration and interdependence of the dimensions of sustainable development: (a) environment or ecological, (b) economic, and (c) socio-cultural dimensions, including a political will.

However, guaranteeing economic and infrastructural development with serious consideration of ecological sensitivities can be challenging in the face of climate change, poverty, inequality, little or no alternative sources of livelihood for nature-dependent communities, and other stressors. The government of the Gambia has destroyed nature sites for infrastructural development. Consequently, not all nature sites have the potential to achieve a successful ecotourism venture or enterprise due to ecological sensitivities or fragilities.

Climate change and human activities have affected many aspects of forest ecosystems over the last three decades. These include tree growth and dieback, the presence of invasive forest fires, species distribution, and migration, seasonal patterns in ecosystem processes, population dynamics, species extinctions, and poor ecotourism implementation including communication gaps (Attemene & Eguavoen, 2017; Gomez et al., 2020). Ecotourism is not only important as a substitute for mass tourism, which has high negative impacts on culture and environment and even triggers possibilities for sex tourism but it improves the economic status of the locals, promotes and supports conservation efforts in such communities while impacting less on culture (Ondicho, 2012).

According to Okech and Bob (2009), local people who are key stakeholders and beneficiaries in ecotourism ventures are often reduced to spectators by the elites, government, and private practitioners. This, by far, defeats the principles of ecotourism. For any sustainable implementation of ecotourism, community participation is key. However, disunity among community members can hinder the progress of any such venture if the ownership and management are solely left to the community (UNDP, 2002).

The identified sites for this study are Bijilo Monkey Forest, Makasutu Culture Forest, and River Gambia National Park. The identified places are the few most popular ecotourism destinations in The Gambia. This research seeks to understand the sustainability index of the destinations, attraction potentials of the ecotourism sector, and economic viability.

II. LITERATURE REVIEW

Ecotourism has emerged as a key strategy for promoting sustainable development, particularly in sensitive ecological areas. However, the effectiveness of ecotourism

initiatives in achieving sustainability goals can be difficult to measure. The MDS-RAPFISH tool offers a systematic approach to evaluating the sustainability of ecotourism practices. This review synthesizes current literature on ecotourism sustainability, focusing on applying the MDS-RAPFISH tool (Sambou et al., 2019; Fauzi & Anna, 2005).

While the MDS-RAPFISH tool provides valuable insights, it is not without challenges, such as data reliability, the complexity of ecosystems, and the changing dynamics of ecosystems. The subjective nature of expert opinions can introduce biases, affecting the reliability of the assessments (Jovanovic et al., 2022; Hakim et al., 2022). Ecological systems are inherently complex, and capturing this complexity in a multi-dimensional model can be challenging (Hockings, 2000). Sustainability is a dynamic concept; thus, assessments must be regularly updated to reflect changes in environmental and socio-economic contexts (Miller et al., 2017).

The MDS-RAPFISH tool has proven to be a useful framework to evaluate ecotourism sustainability across various contexts. Its ability to incorporate multiple dimensions of sustainability and facilitate stakeholder engagement makes it particularly valuable. However, the tool needs to refine methodologies, enhance data collection processes, and explore its application in diverse ecological and cultural contexts (Riniwati et al., 2016). Therefore, other tools were used due to the context of this research to improve accuracy in methodological loopholes and outright avoidance of methodological monocropping in a changing ecosystem variability in ecosystems. The characteristics of each destination should inform the methods used to assess the sustainability index, while the local people remain key players in any assessment.

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If the ecotourism principles are neglected, serious environmental damage/degradation can occur rapidly and irreversibly as well as social conflicts (Gomez et al., 2020; Sambou et al., 2024). Ecotourism development has not been a top priority for The Gambia, but with the current trend of environmentalism, as people become more aware and conscious of their environment, with increased nature travelers and enthusiasts in the country, the narratives are gradually changing with numerous challenges (Jarjou & Walther, 2021).

III. MATERIAL AND METHOD

A. Study Sites

The identified sites for this study are Bijilo Monkey Forest, Makasutu Culture Forest, and River Gambia National Park (Figure 1). The identified places are the few most popular ecotourism destinations in The Gambia. This research seeks to understand the sustainability index of the destinations, attraction potentials of the ecotourism sector, and economic viability. The geographic conditions, climate, topography, and geomorphological conditions in the Gambia indicate the unique potential for the country's ecotourism, particularly along the coast and the River Gambia. The chosen destinations are the most popular ecotourism destinations in the country. They possess higher tourist attractions and are celebrated nature spots in the country.

Bijilo Monkey Forest

The Nature Trail is also referred to as the Monkey Park. It is predominantly inhabited by different species of monkeys, including the endangered Red Colobus. It is situated along the Atlantic Ocean next to the beach on the

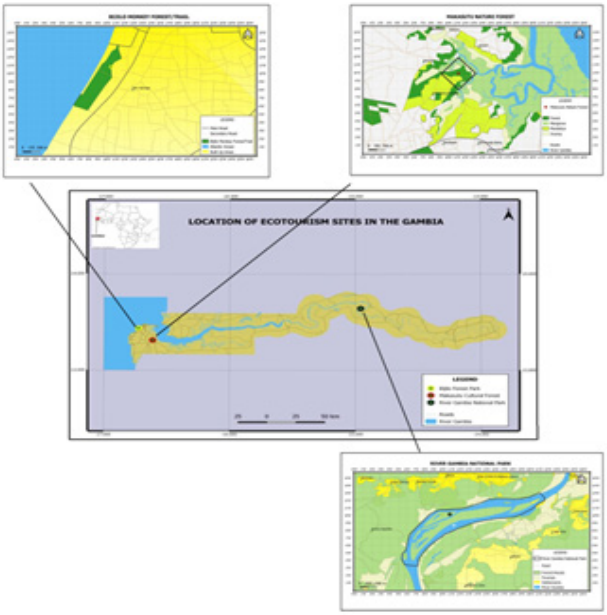

Figure 1. Map of the study area

south, within the coastal zone in Bijilo, Kombo North District, in the West Coast Region of The Gambia. The 51.3 ha forest was gazette in 1952 during the British colonial rule in The Gambia. It was designated an ecotourism center in 1991 (Sambou et al., 2024; Sambou et al., 2023).

Makasutu Cultural Forest

"Makasutu" is a combination of two "Mandinka" words, "Maka" meaning a holy place in Islam in Macca, and "Sutu," meaning forest. Makasutu means "Holy Forest". The private ecotourism destination opened in 1999. It covers an area of 405 ha, including a tributary of The River Gambia with a lodge called Mandina Lodge. The site is located in Makasutu Village in Kombo Central in the West Coast Region of The Gambia. The area has a spiritual and cultural significance, making it easy to protect from encroachment.

River Gambia National Park

The River Gambia National Park is a marine ecotourism destination. It was gazette in 1978 as a national park with five (5) islands within the protection, with an area of 585 ha. The park is located along the River Gambia with five surrounding communities namely Sambel Kunda, Misera, Banni, Yida, and Touba, within Niamina East District in the Central River Region of The Gambia. The destination is famous for its rich biodiversity, especially the endangered hippopotamus and the reintroduced chimpanzees.

B. Methods

Sampling and Data Collection

Purposive sampling is given preference in this research, which is a selection of sample members based on the specific objectives and considerations of the researcher. This sampling design enables the generalizability of findings to the whole population (Sekaran, 2016). We selected 200 respondents in each destination who are either direct stakeholders or have knowledge of ecotourism management in the selected destinations, as in Table 1 below.

Data Collection

The research topic consists of different stakeholders therefore, a survey will also be used to provide answers to the research questions. A mixed method will be used in data collection. Some data will be acquired from the ecotourism destination to be examined. This will be done through questionnaires, literature reviews,

Table1. Questionnaire distribution table

Description	Maka Sutu Cultural Forest		Monkey Park		River Gambia National Park	
	Number	*percentage*	*Number*	*Percentage*	*Number*	*Percentage*
Local community	50	25%	47	23.5%	59	29.5%
University students	40	20%	45	22.5%	35	17.5%
Tourists	45	22.5%	43	21.5	38	19%
Sectoral experts	22	11%	20	10%	19	9.5%
Local businesses	43	21.5%	45	22.5%	49	24.5%
Total	200	100%	200	100%	200	100%

stakeholder interviews, and observations (Pitcher & Preikshot, 2001). The study will use both primary and secondary data. The required data will be collected both during the tourism season and during the off-season. The primary data included the perceptions of respondents related to the sustainability dimensions under study, such as (a) Conservation, (b) Community participation, (c) Economy, (d) Education and recreation (e) Control.

Questionnaire

A questionnaire is a research tool containing a sequence of questions to collect data from respondents. The study used a uniform questionnaire for all three destinations through purposive sampling of respondents. Two hundred (200) questionnaires were administered at each destination, making it 600 in all three destinations within 12 months. The questionnaire is divided into five parts: ecology, economy, participation, education, and awareness and control. These indicators are meant to determine the sustainability index through MDS while a different questionnaire was used to measure the weight through AHP analysis. The respondents range from ecotourism employees, tourists, community members, academics, sectoral experts, tour guides, and local business owners.

C. Analysis

Sustainability research requires interdisciplinary and multidisciplinary approaches in understanding complex socioeconomic and ecological issues. This research combines different statistical analyses such as MDS, Content Analysis (CA), and AHP in a mixed research methodology that bridges the quantitative and qualitative approaches (Harahab et al., 2021). In a multidimensional context, this research combines five dimensions in a single study: ecology, economy, education, participation, and control/legislation. Multidimensional Scaling provides the current status of sustainability, and AHP enables better, more effective, and efficient policy strategy development, while Content Analysis was used to determine the challenges of ecotourism (Kholil et al., 2014; Pawirosumarto et al., 2017; Saputro et al., 2024). Integrating these approaches in a study can provide dependable outcomes in scientific research. This is to say, using both MDS Rapfish and AHP in ecotourism sustainability research provides an integrated approach to assessment and the development of policy priorities for complex sustainability issues (Leeuw et al., 2000; Pitcher & Preikshot, 2001)

The information obtained will present a relationship between the indicators under study and the sustainability index. Sustainability Index Analysis of ecotourism destinations was conducted using RAPFISH methods for this study (Riniwati et al., 2019; Harahab et al., 2021). Euclidean distance determines the coordination technique, which is in dimensional space (Alder et al., 2000):

$$d = \sqrt{(|x_1 - x_2|^2 + |y_1 - y_2|^2 + |z_1 - z_2|^2 + \cdots)} \quad ...(1)$$

The configuration of an object or a point in MDS is approximated by regressing the Euclidean distance (dij) from point (i) to point (j), with the origin as follows:

$$d_{ij} = \alpha + \beta\delta_{ij} + \varepsilon \quad \text{.....(2)}$$

Determination and Assessment of Sustainability Attributes

Determining the sustainability attributes and indicators involves referring to several approaches to the dimensions of sustainability under study: conservation/ecological, participation, education and recreation, economics, and control. These dimensions are compiled following the literature and in other fields related to the sustainability of ecotourism practice. Interviews with experts, practitioners, academics, and locals within the destinations informed the outcomes too. The range of scores was determined to be between 0 and 3 about the condition of each dimension. The determination value of 0, which is bad, describes a condition that provides the least advantage for ecotourism sustainability. Likewise, a score of 3, indicating good, describes a condition that provides the most benefits for ecotourism sustainability (Alder et al., 2000). Comparing the good and the bad assessment determines the middle or the intermediate value (Nuryadin et al., 2015). The modified attributes for the assessment are based on the five dimensions under study.

The goodness-of-fit

The goodness-of-fit for MDS is determined by the level of stress value (Alder et al., 2000), while the level of coefficient (R^2) determines model validity (Kavanagh & Pitcher, 2004). In a goodness-of-fit analysis, stress value is expected below 0.25 and R^2 close to 1 or 100%. The following equation through the ALSCAL method helps in its determination where (squared distance = dijk) to the square of the data (starting point = Oijk), which in three dimensions (i, j, k) is written as in the S-Stress formula below:

$$S = \sqrt{\frac{1}{m}\sum_{k=1}^{m}\left|\frac{\sum_i\sum_j(d_{ijk}^2 - o_{ijk}^2)^2}{\sum_i\sum_j o_{ijk}^2}\right|} \quad \text{.....(3)}$$

where the squared distance = Euclidean distance, which is:

$$d_{ijk}^2 = \sum_{a=1}^{r} w_{ka}\left(x_{ia} - x_{ja}\right)^2 \quad \text{.....(4)}$$

To Determine the Sustainability Index of Ecotourism within the Study Area

1. Five dimensions were included: conservation, participation, economy, education and recreation, and control or legal. Each dimension is then measured using the attributes of each.
2. The valuation of each attribute is based on the sustainability criteria of each dimension. The attribute of each dimension was used for the valuation based on the independent opinion of the respondents according to the requirement.
3. Calculating the sustainability index and analyzing the sustainability status, we used a Score estimation in which each dimension is expressed by the worst scale (bad) 0% to the best (good) 100%, as in Table 2 below. The sustainability index is the value of each dimension that describes the level of sustainability as per Fauzi and Anna (2005).

Table 2. Index categorization (Fauzi & Anna, 2005)

Sustainability Index	Category
0.00-25.00%	Poor/Unsustainable
25.01-50.00%	Less sustainable
50.01-75.00%	Sustainable
75.01-100.00%	Highly Sustainable

Sensitivity Analysis (leverage)

The leverage sensitivity analysis process determines the most important or sensitive attributes which are determined by a change in ordination if certain attributes are removed from the analysis. The sensitivity of attributes is described by the Root Mean Square (RMS) value, and changes in the RMS describe the influential attributes. The magnitude of the RMS value describes the attributes that are increasingly sensitive to supporting the sustainability of ecotourism in the destinations under study. The RAPFISH analysis technique is used to analyze the sensitivity of the leverage obtained from the difference between scores with and without attributes based on standard error (Fauzi & Anna, 2005).

Multidimensional Weights

The RAPFISH technique analysis can only determine the status of each sustainability dimension and not the status of multidimensional sustainability. It is incorrect and not permissible to take the average score of all dimensions due to differences in attributes. Therefore, to determine the weight of each dimension of sustainability in a multidimensional manner, an Excel program is used, a modification of an AHP. The AHP is used to acquire solutions for complex multi-criteria problems by dividing the problem into several hierarchical levels. Sixty (60) respondents with knowledge of ecotourism were used as respondents for the AHP questionnaire as well as participated in focused group discussions. Some factors or criteria are interrelated at each level of the hierarchy (Basak & Saaty, 1993). In computing the pairwise matrix using AHP analysis, the following equation is used:

$$CR = \frac{CI}{RI} \; dan \; CI = \frac{(\lambda max - N)}{(N-1)}) \quad \text{.....(4)}$$

Where:
CR = Consistency Ratio,
CI = Consistency Index,
RI = Random Consistency Index,
N = the metric comparison size and
λmax = Largest Eigenvalue.

To answer the third objective of this research, which seeks to formulate guidelines for sustainable ecotourism implementation in the Gambia, focus group discussions (FGD) will be conducted on the results of the three (3) destinations. There will be formulated implementation steps (with flowchart) to achieve sustainable ecotourism.

IV. RESULT AND DISCUSSION

A. Result

According to Table 3, the S-Stress value of the four dimensions is less than 0.25 and the R-squares are more than 0.90. It means that the result of MDS-RAPFISH analysis can be accounted for or veritable. Since the criteria for goodness-of-fit is fulfilled, then the analysis to assess the sustainability status for each dimension can be carried out.

(a) Conservation Dimension

Figure 2, Figure 3, Figure 4, and Figure 5 show the sustainability index and attribute sensitivity of conservation dimensions for

Table 3. Summary goodness-of-fit MDS-RAPFISH analysis

Dimension	Maka Sutu Cultural Forest		Monkey Park		River Gambia National Park	
	Stress (S)	*R-Square (R)*	*Stress (S)*	*R-Square (R)*	*Stress (S)*	*R-Square (R)*
Conservation	0.1465	0.9464	0.1602	0.9403	0.1353	0.9509
Participation	0.1502	0.9456	0.1628	0.9397	0.1552	0.9434
Education and recreation	0.1675	0.9093	0.1543	0.9219	0.1735	0.9066
Economy	0.1936	0.9269	0.1607	0.9335	0.1722	0.9307
Control	0.1905	0.9269	0.1625	0.9328	0.1601	0.9423

Source: Add-ins Ms. Excel Rapfish, 2024

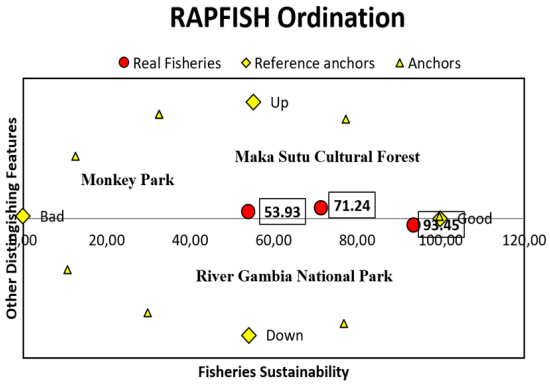

Figure 2. Sustainability index for conservation dimension (*add-ins Ms. Excel Rapfish, 2024)*

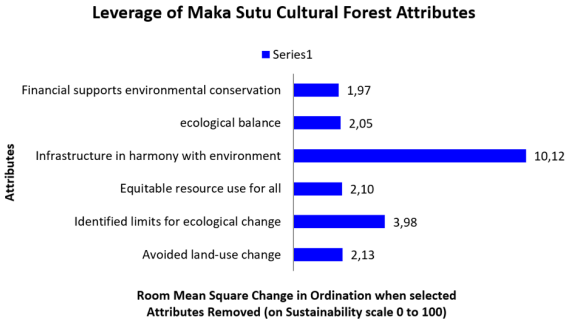

Figure 3. Attribute sensitivity for conservation dimension for Maka Sutu (*add-ins Ms. Excel Rapfish, 2024*)

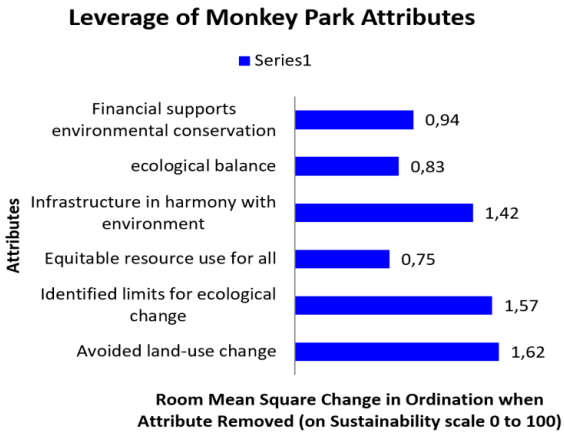

Figure 4. Attribute sensitivity for conservation dimension for Monkey Park (*add-ins Ms. Excel Rapfish, 2024)*

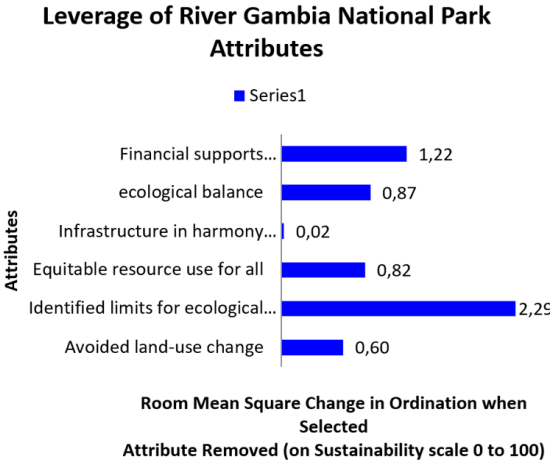

Figure 5. Attribute sustainability for conservation dimension for RGNP (*add-ins Ms. Excel Rapfish, 2024)*

Maka Sutu Cultural Forest, Monkey Park, and River Gambia National Park respectively. Figure 2 shows that the sustainability status for the Conservation Dimension with Maka Sutu Cultural Forest is 71.24%, which is classified as Satisfactory Sustainable, Monkey Park is 53.93%, classified as Satisfactory Sustainable, and River Gambia National Park is classified as very sustainable with 93.45%. The sustainability status of Ecology can be increased by giving more attention to the attributes which have high leverage as in Figure 3. The attributes are indicators of *Infrastructure in harmony with the environment and Identified limits for ecological change*. The sustainability status of ecology can be increased by giving more attention to the attributes which have high leverage as in Figure 4. The attributes are indicators of *Avoided Land-use Change and Identified limits for ecological change*. The sustainability status of Ecology can be increased by giving more attention to the attributes which have high leverage as in Figure 5. The attributes are indicators of *Identified limits for ecological change and financial support for environmental conservation*.

(b) Participation Dimension

The sustainability index and attributes sensitivity are presented in Figure 6, Figure 7, Figure 8, and Figure 9. Figure 6 shows that the sustainability status for the participation dimension, with Maka Sutu Cultural Forest

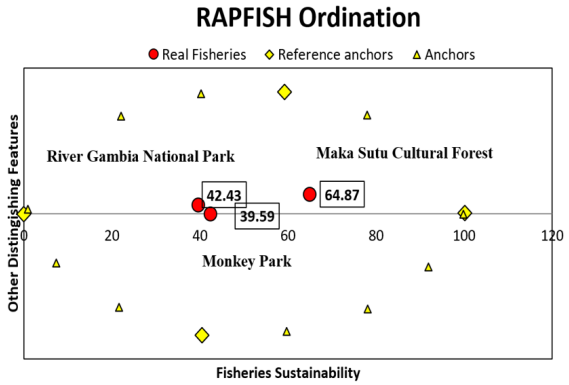

Figure 6. Sustainability index for participation dimension (*add-ins Ms. Excel Rapfish, 2024)*

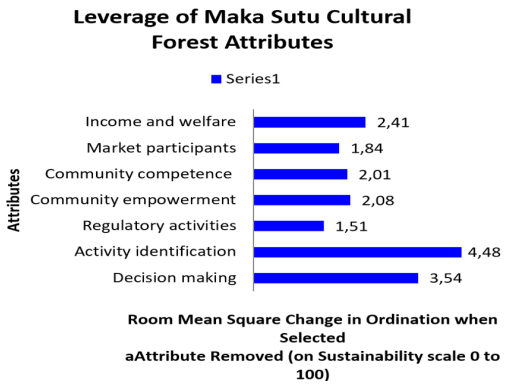

Figure 7. Attribute sensitivity for participation dimension for maka sutu (*add-ins Ms. Excel Rapfish, 2024)*

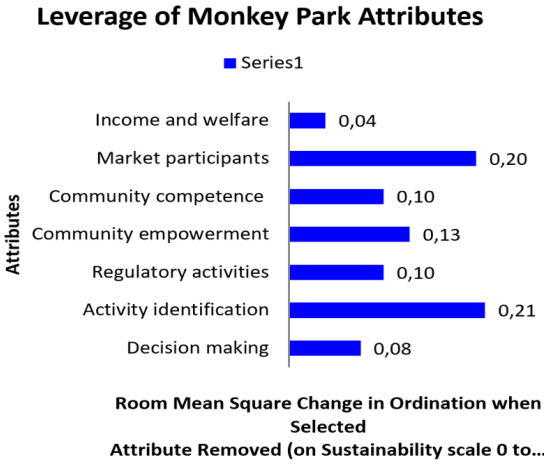

Figure 8. Attribute sensitivity for participation dimention for Monkey Park (*add-ins Ms. Excel Rapfish, 2024)*

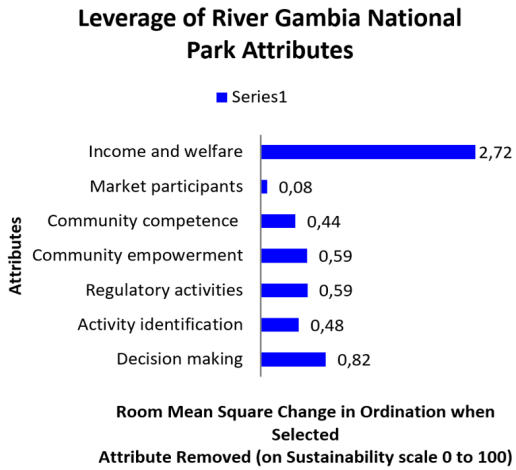

Figure 9. Attribute sensitivity for participation dimension for RGNP (*add-ins Ms. Excel Rapfish, 2024)*

is 64.87%, which is classified as Satisfactory Sustainable, Monkey Park is 39.59% classified as Less Sustainable, and River Gambia National Park is classified as less sustainable with 42.43%.

The sustainability status of community participation can be increased by giving more attention to the attributes that have high leverage as in Figure 7. The attributes are indicators of **Activity Identification** and **Decision Making**. According to Figure 8, the disadvantage of the participation dimension is less with indicators of **Activity Identification** and **Market Participants**.

(c) Education and Recreation Dimension

Figure 10 shows that the sustainability status for the Education and Recreation Dimension with Maka Sutu Cultural Forest is 53.69% which is classified as Satisfactory Sustainable, Monkey Park is 78.16% classified as Very Sustainable, and River Gambia National Park is classified as Satisfactory Sustainable with 56.71%.

The sustainability status of Education and Recreation can be increased by giving more attention to the attributes that have high leverage as in Figure 11. The attributes are indicators of the **Value of characteristics of nature** and **Information on cultural values**. Figure 12 gives notes on indicators of **Interpretation of environmental values** and **Value of characteristics of nature** since their leverage/sensitivity scores are the highest.

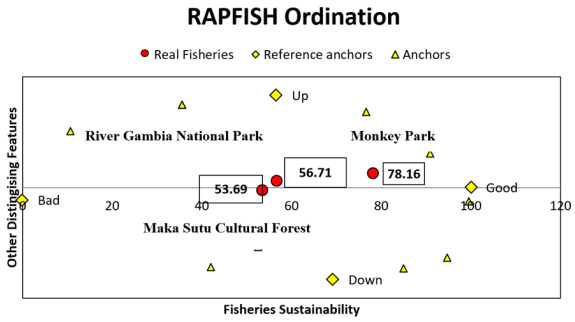

Figure 10. Sustainability index for education and recreation dimension (*add-ins Ms. Excel Rapfish, 2024*)

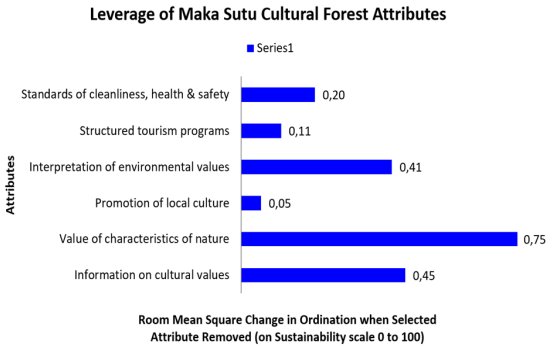

Figure 11. Attribute sensitivity for education dimension for Maka Sutu(*add-ins Ms. Excel Rapfish, 2024*)

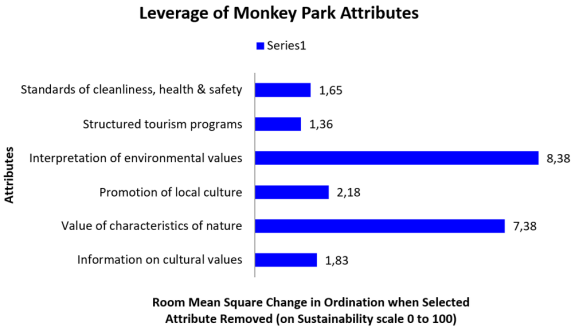

Figure 12. Attribute sensitivity for education dimension for Monkey Park (*add-ins Ms. Excel Rapfish, 2024*)

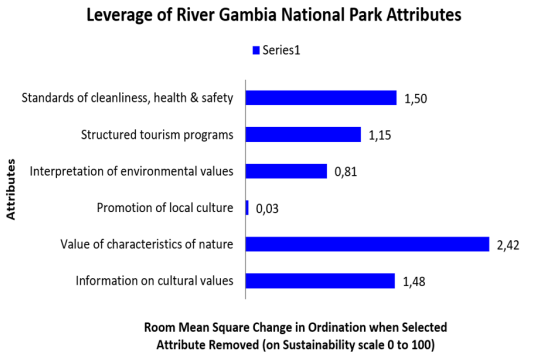

Figure 13. Attribute sensitivity for education dimension for RGNP (*add-ins Ms. Excel Rapfish, 2024*)

Figure 13 shows that indicators of the **Value of characteristics of nature** and **Standards of cleanliness, health,** and **safety** are to be given more prominence since they have the highest leverage/sensitivity scores.

(d) Economy Dimension

Figure 14 presents the sustainability status for the Economy Dimension with Maka Sutu, with the highest 69.31% categorized as satisfactory sustainable, 53.33% for the Monkey Park, and 47.21% (Less Sustainable) for the River Gambia National Park. Figure 15 indicates that the highest leverages are the attribute *trade in agricultural products* and employment expansion. Therefore, to increase the sustainability of the economic dimension of Maka Sutu, the above indicators need to be considered. Figure 16 shows the highest attributes for *trade in agricultural products* and *employment expansio*n. Both need to be considered since their leverage for sensitivity is the highest to increase the economic dimension of sustainability.

Figure 17 shows the highest attributes on *trade in agricultural products* and *Revenue Increase.* Both need to be considered since their leverage for sensitivity is the highest to increase the economic dimension of sustainability.

(e) Control Dimension

Figure 18 below shows the sustainability index and attribute sensitivities of the Control Dimension for Maka Sutu Cultural Forest with an index of 51.73% (satisfactory sustainable), Monkey Park with 68.39% (satisfactory sustainable, and River Gambia National Park with the highest sustainability index of 76.23% (highly sustainable).

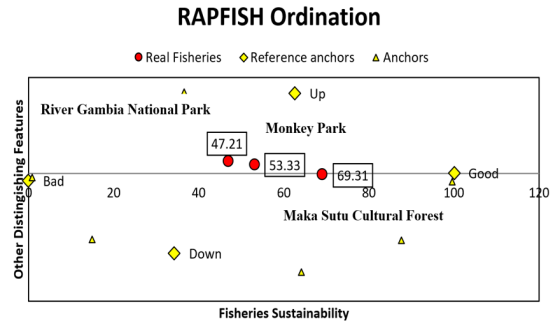

Figure 14. Sustainability index for economy dimension (*add-ins Ms. Excel Rapfish, 2024*)

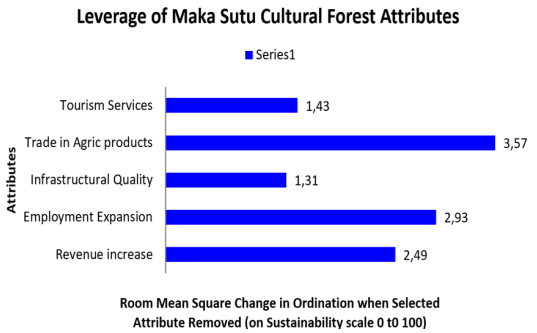

Figure 15. Attribute sensitivity for economy dimension for Maka Sutu (*add-ins Ms. Excel Rapfish, 2024*)

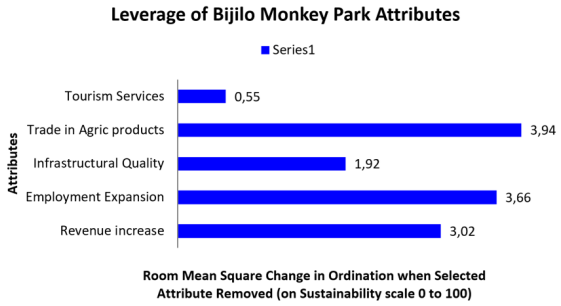

Figure 16. Attribute sensitivity for economy dimension for Monkey Park (*add-ins Ms. Excel Rapfish, 2024*)

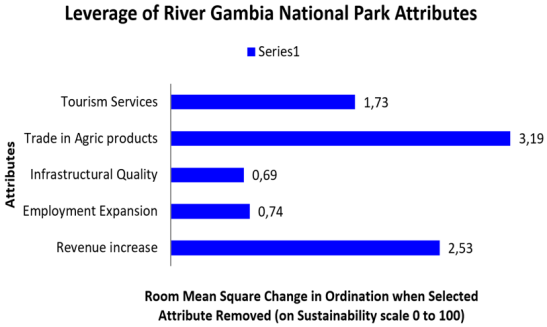

Figure 17. Attribute sensitivity for economy dimension for RGNP (*add-ins Ms. Excel Rapfish, 2024*)

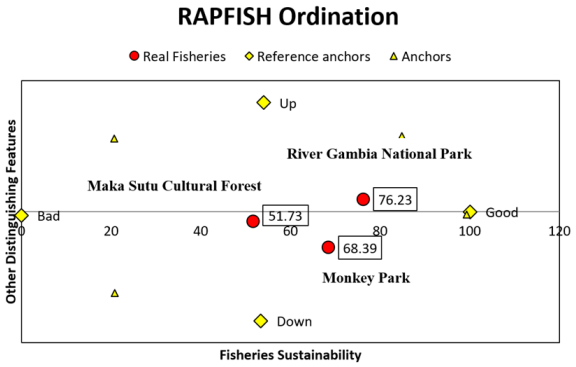

Figure 18. Sustainability index for control dimension (*add-ins Ms. Excel Rapfish, 2024*)

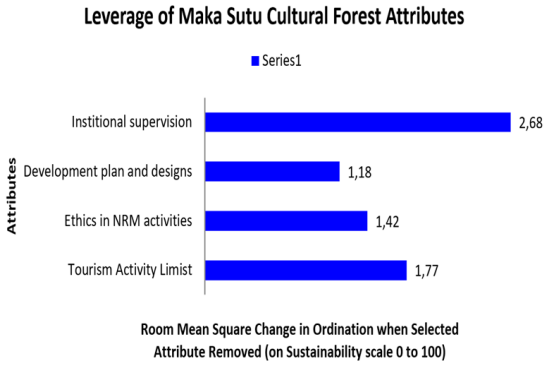

Figure 19. Attribute sensitivity for control dimension for Maka Sutu (*add-ins Ms. Excel Rapfish, 2024*)

Figure 19 shows the highest attributes of Institutional supervision and Limits to tourism activities. Both need to be considered since their leverage for sensitivity is the highest to increase the control dimension of sustainability. Figure 20 indicates that the highest leverages are the attribute ethics in NRM activities and development plans and designs. Therefore, to increase the sustainability of the control dimension of Monkey Park, the above indicators need to be considered.

According to Figure 21, the disadvantage of the Control Dimension is less with indicators of *ethics in NRM activities and development plans and designs*. Figure 22 presents that the sustainability status of all the used dimensions is classified as

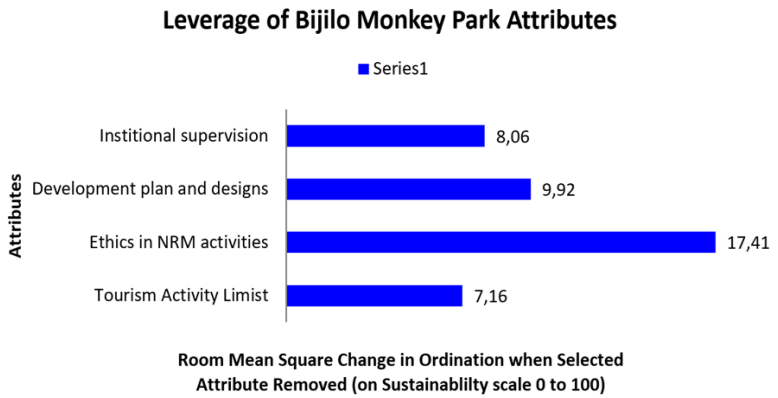

Figure 20. Attributes sensitivity for control dimension for Monkey Park (*add-ins Ms. Excel Rapfish, 2024*)

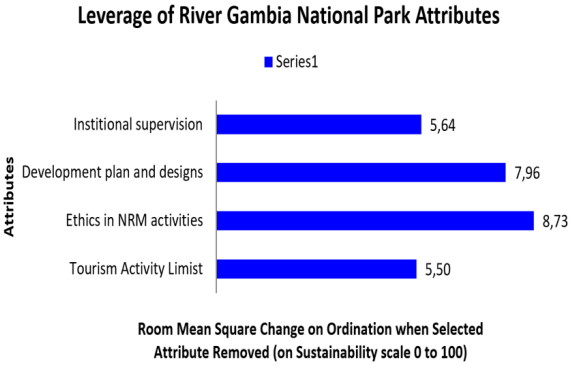

Figure 21. Attributes sensitivity for control dimension for RGNP (*add-ins Ms. Excel Rapfish, 2024*)

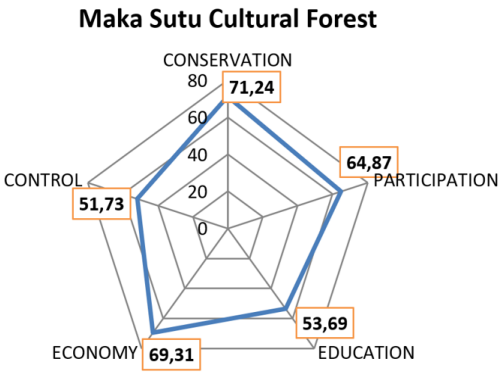

Figure 22. Kate diagram for sustainability analysis for Maka Sutu (*add-ins Ms. Excel Rapfish, 2024*)

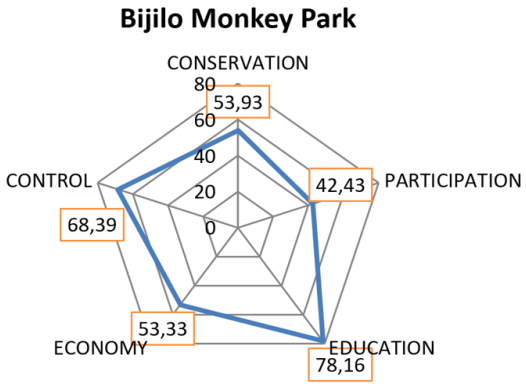

Figure 23. Kate diagram for sustainability analysis for Monkey Park (*add-ins Ms. Excel Rapfish, 2024*)

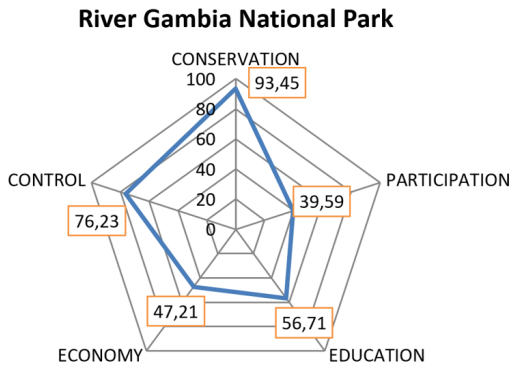

Figure 24. Kate diagram for sustainability analysis for RGNP (*add-ins Ms. Excel Rapfish, 2024*)

sustainable. The overall sustainability status is sustainable with an index of 62.17. The most sustainable dimension is conservation, while the lowest one is the control dimension.

Figure 23 presents the sustainability status of all the dimensions used for the Monkey Park, which is classified as sustainable. The overall sustainability status is sustainable, with an index of 59.25%. The most sustainable dimension is education, while the least one is the participation dimension. Figure 24 presents that the sustainability status of all the used

dimensions for the Monkey Park is classified as sustainable. The overall sustainability status is sustainable, with an index of 62.64%. The most sustainable dimension is conservation, while the least is the participation dimension.

Table 4 above has the sustainability index of the overall multidimensional sustainability value of all destinations under study. The River Gambia National Park has the highest sustainability index out of the three destinations under study with a multidimensional sustainability value of 69.03% followed by Makasutu Cultural Forest with 64.49%, while Monkey Park has the least among the three with an index of 54.94%. All destinations are classified as sustainable.

Maka Sutu Cultural Forest has an overall sustainability index of 64.49% which is classified as sustainable. The dimensions under study have shown that conservation/ecology has the highest sustainability index of 71.24%, while the least is the control dimension with an index of 51.17%. Education & Recreation has the highest index for Monkey Park (78.16%) while participation appears to be less sustainable with an index of 42.43%.

1) Conservation or Ecological Dimension

93.45% which is the highest sustainability score recorded in this study is for the ecology/conservation dimension at River Gambia National Park and the lowest index is participation for the park, with an index of 39.59%. River Gambia National Park with the highest sustainability index on conservation at 93.45%, Maka Sutu Cultural Forest at 71.24%, and Monkey Park at 53.93%. Conservation is classified as sustained for all three destinations.

2) Participation Dimension

Participation in Maka Sutu has the highest index of 64.87%, Monkey Park at 42.43%,

Table 4. Multidimensional sustainability index (%) of the destinations under study

No.	Destinations/ Dimensions	Aspect Value	Weight	Total Value
	Maka Sutu Cultural Forest			
1.	Conservation	71.24	0.38	27.07
2.	Participation	64.87	0.272	17.65
3.	Education & Recreation	53.69	0.054	2.9
4.	Economy	69.31	0.094	6.52
5.	Control	51.73	0.2	10.35
6.	**Total**	**310.84**	**1.0**	**64.49**
	The Bijilo Monkey Park			
1.	Conservation	53.93	0.38	20.49
2.	Participation	42.43	0.272	11.54
3.	Education & Recreation	78.16	0.054	4.22
4.	Economy	53.33	0.094	5.01
5.	Control	68.39	0.2	13.68
6.	**Total**	**296.24**	**1.0**	**54.94**
	River Gambia National Park			
1.	Conservation	93.45	0.38	35.51
2.	Participation	39.59	0.272	10.77
3.	Education & Recreation	56.71	0.054	3.06
4.	Economy	47.21	0.094	4.44
5.	Control	76.23	0.2	15.25
6.	**Total**	**313.19**	**1.0**	**69.03**

and River Gambia National Park at 39.59%. Maka Sutu is classified as sustainable while the Monkey Park and the River Gambia National Park are less sustainable. The participation of communities in ecotourism activities is less considered in these two sites. The state solely controls the monkey park, while partnering with a private western investor in the River Gambia National Park, thereby limiting natives from participating in ecotourism activities.

3) Education & Recreation Dimension

The Education and Recreation Dimension of the Monkey Park is highly sustainable, with an index of 78.16%, followed by the River Gambia National Park with an index of 56.71% and 53.69% for Maka Sutu Cultural Forest. Overall, all destinations are sustainable in this dimension. The Monkey Park and River Gambia National Park also serve as research centers for primates and chimpanzees, respectively. Direct educational tours are conducted on both destinations while primatologists, ornithologists, and sustainability researchers use the sites for ecological studies. The Monkey Park is used by the University of The Gambia and foreign undergraduate and postgraduate student researchers for ecological research assignments and excursions.

4) Economic Dimension

Economically, Monkey Park is the highest ecotourism attraction in the country with more economic output. However, that's not reflective of the results obtained because it's a state-run ecotourism enterprise where community members have no stake and no direct benefits compared to Maka Sutu, which is community-based and community-driven with an economic index of 69.31%, while the Monkey Park is indexed 53.33% and River Gambia National Park at 47.21% which is less sustainable/ unsustainable.

5) Control or Legislation Dimension

Control in Maka Sutu has the lowest index at 51.73%, Monkey Park at 68.39%, and River Gambia National Park with the highest level of sustainability at 76.23%. Overall, classified as sustainable in all destinations. Government-operated ecotourism enterprises have more control mechanisms compared to private-operated ecotourism destinations. Both River Gambia National Park and the Monkey Park are state-operated while the Maka Sutu with the lowest index is private. Private practitioners in countries without a law on ecotourism practice or a clear regulation, tend to focus more on profit making. However, control without effective community participation can lead to social tensions and conflicts over ownership and use of resources.

Nature and Society – the Ethnographic Account of the Sites Under Study

The communities within the Bijilo Monkey Forest are relatively rich people, occupied by big businesses, government facilities, hotels, etc. It is characterized as the country's biggest tourist concentration. There is little interest in the park by the people and it only gets their attention when primates move to homes to get food from domestic fruit trees, such as mango, bananas, etc. However, the continuous edge effect that hits the park is causing negative human-wildlife interaction within the environment (Sambou et al., 2023). There are claims on the importance of the park to remain and counter claims for it to be changed to a human settlement due to its prime location. In 2016/17, over 7ha of the park area was bulldozed for the construction of a conference center. Activists and concerned groups protested to protect the remainder of the park which the government wants to sell.

The edge effect has caused significant defaunation in the park. Lack of sufficient food for the primate population in the park, thereby causing movement into human settlements for food and shelter. The ecological niche of the primates covers areas that have now been converted to human settlements. The park is probably the main tourist attraction in the area, as well as the ocean, leading to the proliferation of businesses e.g. hotels, restaurants, clubs, banks, craft markets, etc. However, it's the

only existing nature ecology within the greater Banjul area and is surrounded by hotels and big business centers. It's a free forest in the city. It faces threats of destruction and the community mentality is that it does not provide direct benefits to the people. Community participation in the management of the park is nonexistent as it's solely managed by the Department of Forestry. When the community is not involved, the tendency for unsustainable ecotourism practice is highly evident.

Maka Sutu Cultural Forest is a spiritually important ecosystem to the people of Kembujeh and its surroundings. The private ecotourism practice has little impact on the activities of the locals within the area. The spiritual connections have made it easy to manage as believers visit the site to pray for good fortune, and causing harm to the forest can bring bad luck. Spiritually connected nature sites tend to have a higher tendency for sustainability, while non-religious sites risk economic exploitation and ecological damage (Sambou et al., 2023).

The most unsustainable dimension from the MDS analysis of the Monkey Park and the River Gambia National Park is participation. This is equally evident from observation and the focus group discussions in the five villages surrounding the River Gambia National Park. The following key observations sum up the findings:

1. Disunity among the community heads and persistent territorial conflicts over land use and ownership.
2. Ethnic tensions within communities.
3. Some community leaders benefit from the ecotourism practice through bribery, while members of the community are deprived of any chance to utilize the resources within the area, e.g., fishing, wood collection, beekeeping, hunting, or jobs.
4. Limited accessibility to government assistance, huge natural resource knowledge gaps, as well as lack of trusted community leadership

Ecotourism vs Environmentalism and Social Justice

When the practice of ecotourism fails to consider community participation as an essential principle of its implementation in any community, it leads to conflict. Equity and justice are two essential elements of sustainable development, and where communities are neglected or disengaged in the planning and implementation of ecotourism, sustainability becomes difficult to attain. Several environmental movements in the Gambia focus on community empowerment and climate resilience building. Green-Up Gambia is a leading civil society organization that has staged several protests to protect the monkey park from destruction for infrastructural development. In Maka Sutu, the locals are satisfied with the ecotourism practice and feel involved in the project. However, in Bijilo, many households consider the park a nuisance because of the movement of primates into homes in search of food. The financially privileged community is more interested in businesses and infrastructure than nature heritages.

The complete deprivation of the natives of the villages surrounding the River Gambia National Park has increased social injustice and tensions between the villages and the private practitioners. There are common challenges to the sites under study:

1. *Negative Human-Wildlife Interaction*—The high number of baboons in the River Gambia National Park and Maka Sutu Cultural Forest causes significant crop damage to farmers within the area, while the primate population in the Monkey Park runs in hotels and households for food. However, the impact is heavier on farmers whose livelihoods are entirely dependent on the crops they produce. Ecotourism is supposed to be an alternative source of livelihood, but community participation is very low.
2. *Poor Waste Management*—there are no specific guidelines or rules to follow in all these sites, no proper waste management system,

and visitors tend to drop waste haphazardly within the parks. In the monkey park, visitors are allowed to feed monkeys with groundnuts and bananas. The nuts are often packaged in plastic bags and this has caused a high presence of plastics in the park. This is observed at Maka Sutu and insignificantly in the River Gambia National Park.

3. *Animal Grazing*—The Monkey Park shares an ecological function with the International Trypanosomiasis Centre (ITC) where cattle are kept. At the beginning of this research, before the park was fenced, the animals grazed the park, causing foul animal smell and cattle dung across the park area. Maka Sutu isn't a fenced ecology, and animals have access to the site. Such can lead to overgrazing, which can cause significant forest cover depletion. However, the current trends are negligible but need to be regulated to avoid ecological damage. The lack of land-use policy in the country causes conflicts between crop farmers, livestock farmers, and ecotourism practitioners in some areas.

Policy Strategies to Improve Ecotourism Implementation Development of Community-based Ecotourism Centers

Ecotourism management in the Gambia needs a new paradigm, one of which is the involvement of local communities. This paradigm in ecotourism implementation is needed in all ecotourism centers in the country. Customarily, lands belong to communities that include forest and wildlife ecologies used for ecotourism. The state mostly manages them due to law, but the benefactors should be the citizens; their participation is exalted to the success of any ecotourism venture, especially in state forest parks. Community-based ecotourism is widely implemented in countries like Indonesia, where there is clear legislation on ecotourism practice. This approach leads to improved livelihoods through direct and indirect economic benefits and minimizes forest encroachment, illegal logging, poaching, charcoal burning, intended wildfires, and natural resource conflicts (National Development Plan of Indonesia 2005-2025). Figure 38 below shows the needed action points to develop strategies for improved ecotourism in the study destination.

Enactment Ecotourism Implementation Legislation

The Gambia is highly dependent on tourism for its GDP. The destination sells tourism by displaying its natural sites, the Atlantic Ocean, and biodiversity. However, there is no law governing or regulating the practice of ecotourism. It is left to the practitioner to determine what suits their interest. As we postulate a need for the proliferation of ecotourism practices across the country, there is a need for legislation to guide and regulate the implementation of ecotourism. It will protect destinations from exploitation, irreversible ecological damage, and community conflicts (Indonesian Tourism Act, Law No. 10, 2009).

Financial Support for Destination and Human Resource Development

Incomes generated from ecotourism sites managed by the government are not often plowed back to develop the destination or the human capacity within, thereby not attracting the most skilled and trained persons. Destinations are mostly with volunteers who are seeking opportunities to meet Westerners for travels or relationships. The financial burden that comes with starting an ecotourism enterprise often scares communities to invest. With government financial support, ecotourism can be expanded across the country with improved human resource capacity to change the ugly picture that the Gambia is a sex tourist destination for old Europeans.

Development and Standardization of Local Tourism Products

Development of local businesses within the tourism industry, as well as a standardized product value chain, will give an economic, social, environmental, and cultural advantage to local communities and host the nation to

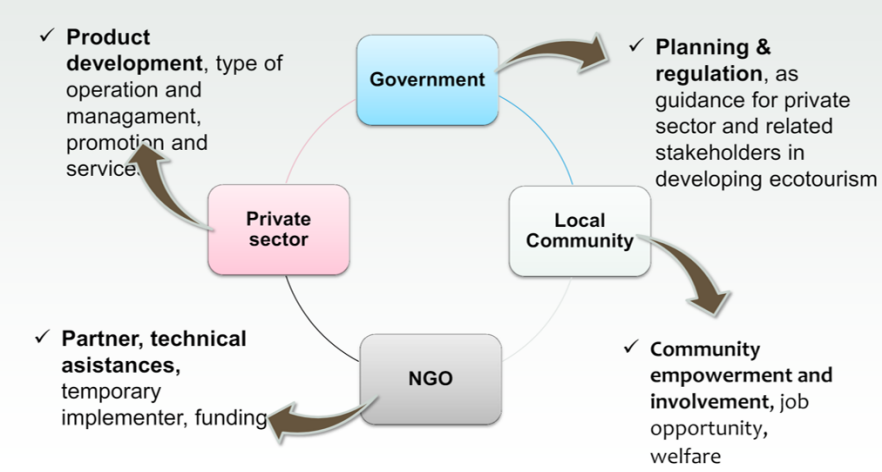

Figure 25. Ecotourism development scheme for the Gambia

avoid revenue leakages; local products serve as foundational attractions to tourist and the standardization of such products will improve service delivery within the industry (see Figure 25 above). It will enable income generation through diversified ventures for locals and lessen the burden of unemployment in the country. It will also ease the burden of product importation.

V. CONCLUSION

Ecotourism is predominantly state-centric in the Gambia and, in some instances, a partnership between the state and foreign private investors. This has left communities with few opportunities to fully participate in ecotourism ventures as one of its core principles. Therefore, ensuring sustainability in ecotourism practice beyond profit-making is necessary for effective ecotourism development in the Gambia. Comparatively, all three destinations under study are fairly sustainable and in good condition, except that the government wants to sell the Monkey Park for a human settlement. Community participation out of the five dimensions used as a benchmark for sustainability is less sustainable for two destinations. The multidimensional sustainability index from the Kate Diagram of the three destinations under study is 69.03%, 64.49%, and 54.94% for River Gambia National Park, Maka Sutu Cultural Forest, and the Bijilo Monkey Forest, respectively. Based on Fauzi and Anna (2005) on sustainability status determination, this study concluded that all the destinations under study are classified as sustainable. However, the community participation dimension needs improvement for fair and equitable distribution of natural resource wealth. The study has postulated three strategies that are not tested but could be utilized as tested for ecotourism practice in the Gambia: (a) development of community-based ecotourism centers, (b) enactment of ecotourism laws and regulations, (c) financial support to boost destination and human resource development and (d) the development and standardization of local tourism products. By integrating MDS and RAPFISH, this study demonstrates a powerful method for evaluating and enhancing ecotourism's sustainability across different regions. This combination allows for the identification of destination-specific sustainability challenges, the development of tailored strategies, and the formulation of policies that are both evidence-based and inclusive of stakeholder perspectives. The result is a comprehensive, adaptive approach to sustainability that can support the long-term health of ecotourism destinations while benefiting local communities and preserving natural resources.

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