



Research Article

Improving Information on Inclusive Tourism and Marketing for Tourists with Accessibility Needs in the Serengeti National Park in Tanzania

Awadhi Titu Mussa¹, Ondabu Ezekiel Kiage², Judy Kibe³, Veronika Piscová^{4,5*}

¹Department of Tourism, College of African Wildlife Management - Mweka, Moshi, Tanzania

²Department of Tourism and Tour Operations Management, Moi University, Eldoret, Kenya

³Department of Tourism, Hospitality and Leisure Studies, Maasai Mara University, Narok, Kenya

⁴Institute of Landscape Ecology, Slovak Academy of Sciences – Branch Nitra, Nitra, Slovakia

⁵Department of Ecology and Environmental Studies, Faculty of Natural Sciences and Informatics, Constantine the Philosopher University in Nitra, Nitra, Slovakia.

***Corresponding author:** Veronika Piscová. Department of Ecology and Environmental Studies, Faculty of Natural Sciences and Informatics, Constantine the Philosopher University in Nitra, Nitra, Slovakia.

Citation: Mussa AT, Kiage OE, Kibe J, Piscová V (2026) Improving Information on Inclusive Tourism and Marketing for Tourists with Accessibility Needs in the Serengeti National Park in Tanzania. J Earth Environ Sci 7: 200. DOI:10.29011/2577-0640.100200

Received: 22 July 2026; **Accepted:** 06 August 2026; **Published:** 20 August 2026

Abstract

This interdisciplinary study links destination marketing with the environmental management of protected areas, addressing inclusive information for tourists with accessibility needs (TwANs) in Serengeti National Park, Tanzania. It examines how communication gaps limit sustainable development while missing opportunities to attract a financially viable market segment. Based on McClelland's theory of needs, an exploratory research design was applied. Through purposive sampling, a sample of 66 participants (tourism officers, operators, guides, managers, and TwANs) was selected. Primary data from semi-structured interviews, focus groups, and field observations were analysed using thematic analysis. The results revealed that the park's information architecture is designed exclusively for the able-bodied population, limiting B2C communication and exacerbating cognitive uncertainty among TwANs. Although the research confirmed the segment's high financial viability, it remains overlooked in Tanzania. The study therefore proposes a phased implementation of European Accessibility Act (EAA) standards – specifically WCAG 2.1 (Level AA) guidelines and the EN 301 549 standard – as a voluntary market benchmark. Recommendations include aligning websites with POUR principles, integrating multi-modal perception at the Serengeti Media Center (subtitles, audio description), distributing tactile maps with Tanzania National Parks (TANAPA), and providing documents in Universal Accessibility (UA) PDF format. These measures represent an effective model of data-driven compensation, replacing physical terrain modifications in sensitive tourist sites with barrier-free digital information.

Keywords: Inclusive tourism information; Tourism marketing; Serengeti; Tourists with accessibility needs; European Accessibility Act (EAA)

Introduction

Improving accessible information flows is a strategic priority for Tanzania as a low-resource destination, given that implementing inclusive standards faces significant infrastructural barriers (Porto et al., 2019). These limitations are particularly evident in Serengeti National Park (SENAPA), where strict rules on habitat conservation preclude invasive terrain modifications. Consequently, park management must compensate for the lack of physical infrastructure by providing high-quality data tailored to users' specific needs (Mulyaningrum et al., 2018). Accurate information on accessibility enables the Tanzanian tourism sector to meet the stringent criteria of developed source markets like the European Union, where Directive (EU) 2019/882 (the European Accessibility Act – EAA) strictly requires information to be available in accessible formats (European Commission, 2024).

An effective tool for implementing these standards is inclusive marketing, which ensures promotional materials authentically reflect a diverse audience. Harris and Taylor (2021) emphasise that inclusive marketing deliberately represents a plurality of identities, cultures, abilities and perspectives to eliminate stereotypes, minimise prejudice and foster a sense of belonging through clear communication practices. Reliable tourism information is crucial for providing accurate, up-to-date data on destinations and facilities (Kiralova & Pavlicecka, 2015; Yoo et al., 2017), whilst digital platforms significantly enhance marketing effectiveness and visitor engagement (Berne et al., 2012; Huang et al., 2017; Sigala, 2018; Vichivanives & Ralangarm, 2015; Xiang, 2018).

Functional accessibility encompasses physical, sensory and communicative dimensions across infrastructure and specific attractions (Mesquita & Carneiro, 2016). Physical infrastructure and accessible information are complementary dimensions determining experience quality and facilitating equal participation for tourists with accessibility needs (TwANs) (Darcy & Buhalis, 2023). Universal design principles advocate creating environments, information and services usable by the widest range of people, promoting dignified participation for visitors with special needs (World Tourism Organisation, 2021).

Tourism marketing materials (TMM), including brochures, guides, websites and mobile apps, are essential for disseminating information. In protected areas, these media facilitate access to data regarding attractions, conservation regulations and safety. For TwANs, accessible formats like Braille, tactile maps, audio descriptions and screen-reader-compatible platforms minimise communication barriers. Consequently, inclusive communication strengthens destination competitiveness, visitor satisfaction and

sustainable development (Theofanous et al., 2024; Kling, 2024). Destination management authorities shape travel decisions through conventional and digital platforms (Hays et al., 2013; Fernández-Cavia et al., 2017). Accessible information is essential for TwANs to experience nature-based tourism safely; however, inaccessible information remains a major barrier despite global efforts to align with universal design (Darcy & Dickson, 2009; Darcy et al., 2020; UN Tourism, 2023).

Furthermore, accessible information in diverse formats increases visitor satisfaction by addressing varied communication needs (Zajadacz & Lubarska, 2020; Závodi et al., 2021). However, data on TwANs remains critically lacking in the sub-Saharan region, leaving this segment's economic potential underestimated in macroeconomic statistics, despite long-standing recognition of the socio-economic benefits of inclusion by global bodies (Weiler et al., 2024; UN Tourism, 2025). A study by Lwoga and Mapunda (2017) highlights that while disability inclusion supports sustainable development, critical information gaps and missing assistive media in Tanzania directly discriminate against disabled visitors.

Applying the EAA and standard EN 301 549 represents a pragmatic economic strategy that respects and builds upon local law (Tanzania Persons with Disabilities Act, 2010), which lacks precise technical specifications for digital accessibility. As the EU is a primary solvent source market for Tanzania, the voluntary adoption of WCAG 2.1 and PDF/UA standards by TANAPA serves as a data compensation tool in line with UN Tourism recommendations, transforming technological limitations into a competitive advantage. This study applies a unique interdisciplinary approach linking destination marketing with environmental management in protected areas. Digital accessibility is viewed as an ecological compensation tool that respects biodiversity conservation limits in sensitive ecosystems like SENAPA, where interventions in the terrain are unacceptable.

Based on these gaps, the primary purpose of this study is to evaluate the existing information architecture in Serengeti National Park and propose a data-driven compensation framework aligning with international benchmarks. To achieve this, the research addresses two key questions: (1) How do current communication gaps limit the travel experience of TwANs in SENAPA? and (2) Can the voluntary adoption of EAA standards transform digital accessibility into a competitive advantage for low-resource destinations?

Methods

Study Area

This study was conducted in the Serengeti National Park (SENAPA) in Tanzania (Figure 1). This park, a UNESCO World Heritage Site, covers an area of approximately 14,763 km² of savannah

ecosystem. Geographically and ecologically, it borders the Maasai Mara National Reserve in Kenya, the Ngorongoro Conservation Area, and the Maswa, Ikorongo and Grumeti game reserves, as well as the Loliondo Controlled Hunting Area. The park was established in 1951 with the primary aim of conserving biodiversity and today represents a key strategic asset for Tanzanian tourism. Protected areas of this type generate approximately 80 per cent of the total number of international visitors to the country (Hunt & Gorenflo, 2018; Bayliss et al., 2014). Field data collection took place at key infrastructure and service hubs within the park, which included the main entry and exit gates and points (including airstrips), visitor information center and selected picnic areas and other tourist sites.

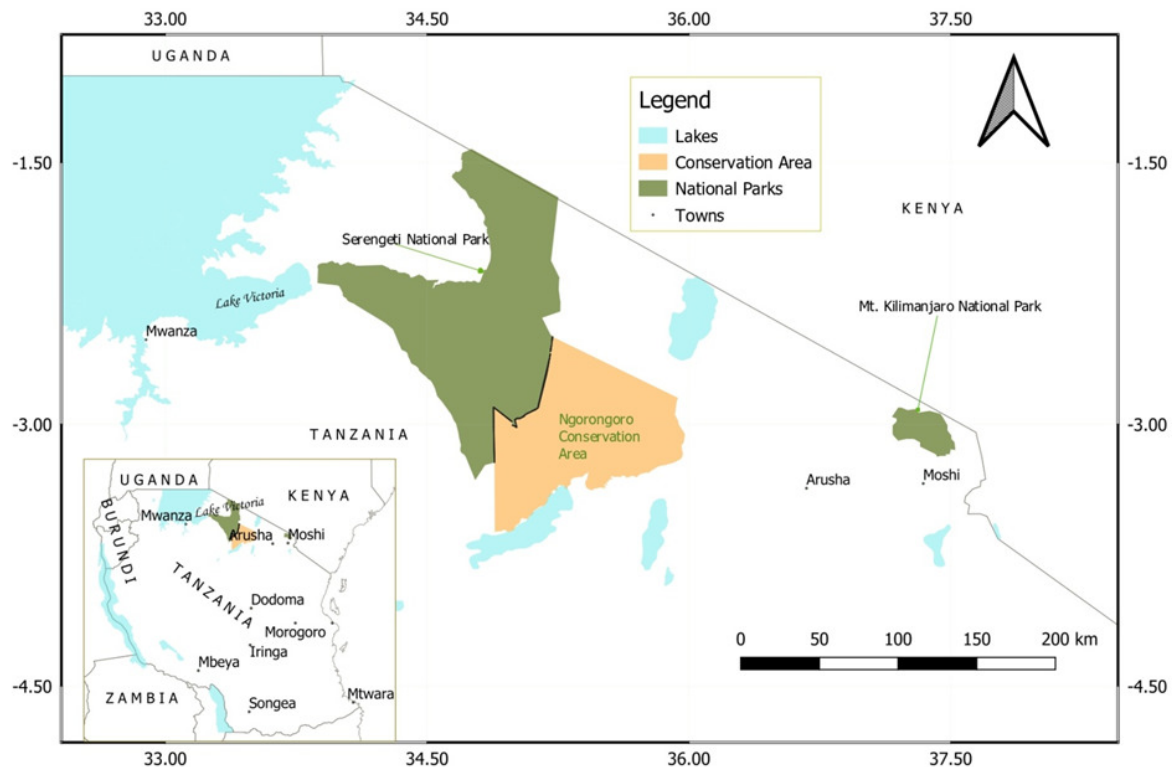


Figure 1: Study area - the Serengeti National Park (SENAPA) in Tanzania.

Research Design

To examine the issue of inclusive tourist information and marketing for tourists with accessibility needs (TwANs), an exploratory qualitative design in the form of a case study focusing on the Serengeti National Park was adopted. This approach enabled a deeper understanding of the real-life experiences, narratives and assessments of key stakeholders directly within the authentic environment of the protected area, whilst the design integrated an interdisciplinary perspective that took into account the strict ecological constraints of biodiversity conservation. Global benchmarks, represented by the European Accessibility Act (EAA), the technical standard EN 301 549 and the Web Content Accessibility Guidelines (WCAG 2.1, Level AA), were used as the normative theoretical and analytical framework for evaluating the accessibility of information systems and marketing strategies. The research was carried out between April and July 2024. Institutional support and ethical approval for the project were secured in advance through an official research permit from the Tanzanian Commission for Science and Technology (COSTECH), which guaranteed full compliance with national ethical protocols for academic research.

Target Population and Sampling Technique

The methodological part of the research (n=66) was designed as purposive sampling from a target population of 292 subjects, with experts meeting strict inclusion criteria focusing on five years' practice and experience with TwANs. The sample was diversified across five categories of participants (tourism officers, tour operators, tour guides, accommodation managers and TwANs), which ensured that theoretical data saturation was achieved for the subsequent thematic analysis. The resulting research sample comprised:

- 26 tourists with accessibility needs (physical, sensory, cognitive or age-related limitations),
- 22 licensed tour guides,
- 8 representatives of local tour operators,
- 7 managers of accommodation facilities (lodges and tented camps),
- 3 tourism officers.

Data Collection Methods and Triangulation

To maximise the trustworthiness, internal validity and reliability of the findings, methodological triangulation was applied (Creswell & Creswell, 2018; Denzin, 2012). The empirical data were collected in parallel using three complementary techniques:

- **Semi-structured interviews:** These were conducted individually in English with key participants (TwANs, tourism officers, accommodation managers, tour guides, tour operators). All interviews were planned in advance, followed a flexible, indicative agenda, and lasted on average between 30 and 40 minutes.
- **Focus group discussions (FGDs):** Based on the participants' availability, six mini-focus groups were formed, each consisting of three to four participants (a total of n = 20 people selected from the overall sample). The groups comprised tour guides and tourists with accessibility needs who had not taken part in individual interviews, which made it possible to observe group dynamics in accordance with methodological recommendations (Krueger, 1994; Morgan, 1997). The discussions were led by trained facilitators, with explicit use of communication and interpreting support to ensure barrier-free and inclusive participation.
- **Participatory observation:** Concurrently, the terrain and interactions were mapped using pre-structured observation checklists, which focused on the accessibility of the physical infrastructure and information media at key points within the park. These checklists were deductively derived from international accessibility criteria for information and communication technologies (ICT) in accordance with standard EN 301 549 and for digital interfaces in accordance with the Web Accessibility Initiative (WAI) guidelines. The study examined the actual compliance of the information service with the POUR principles (perceivability, operability, understandability, robustness) and

the presence of multimodal formats (captions, audio description, tactile elements) in physical distribution centers.

Ethical Considerations

International ethical protocols were strictly adhered to throughout the research process. Participation in the research was entirely voluntary and conditional upon the signing (or alternative confirmation) of an informed consent form. Participants had the right to withdraw from the research at any time and without giving a reason. To ensure absolute confidentiality and anonymity, all participants and entities were assigned unique alphanumeric identification codes, which completely masked their identities in transcripts and during subsequent analysis (Creswell & Creswell, 2018).

Data Analysis

Data processing was carried out systematically immediately after the completion of the fieldwork phase. All audio recordings from individual interviews and FGDs were transcribed verbatim, whilst field notes from observations were converted into comprehensive descriptive reports immediately after leaving the sites. The research team analysed data from these three sources in parallel, which enabled an ongoing comparison of the narratives with the reality observed during fieldwork.

The coding process was carried out manually using inductive open coding (line-by-line text analysis). Through iterative comparison, primary codes exhibiting conceptual isomorphism were grouped into stable categories and subsequently synthesised into overarching themes. The analytical procedure strictly followed the six-phase framework of reflexive thematic analysis as outlined by Braun and Clarke (2022):

1. Familiarisation with the complete dataset,
2. Generating initial codes,
3. Constructing potential themes,
4. Reviewing and re-evaluating themes against the entire data corpus,
5. Final definition and nomenclature of themes,
6. Final drafting of the academic output.

To ensure maximum consistency and minimise subjective bias on the part of the researchers, the extracted themes were continuously cross-checked against the original transcripts and primary field recordings.

Results

Methods of Obtaining Information on Tourism for TwANs

Tourists with accessibility needs (TwANs) use a hybrid model of information gathering, combining verbal communication with

digital platforms, when travelling to challenging areas such as Serengeti National Park. The selection of these sources correlates with McClelland's theory of needs, with the primary aim being to reduce pre-trip cognitive uncertainty. This targeted selection of information sources correlates directly with the psychological drivers defined by McClelland's theory of needs (McClelland, 1988). The main purpose of this strategy is to radically reduce cognitive uncertainty and minimise risks prior to actually travelling to a developing-world destination.

Word-of-Mouth and the Digital Footprint in the Planning Process

Structured interviews revealed that word-of-mouth (WOM) is the primary filter when verifying destination accessibility. One participant (SNV01) noted that personal references from people with similar disabilities satisfied McClelland's needs for achievement, affiliation and power. Obtaining information from trusted sources provides precise practical guidance, creating a strong social connection and sense of empowerment. Knowing that someone in an identical situation successfully completed a Serengeti safari alleviates fear of unfamiliar environments and motivates the final travel decision.

Alongside interpersonal communication, extensive use of online resources is coming to the fore. Participant (SNV06) used the internet to compare attractions in Tanzania's Northern Circuit. Having identified Serengeti National Park and Ngorongoro Crater through digital data, he proactively contacted a Tanzanian tour operator for a bespoke travel package. This demonstrates that whilst digital resources serve as primary sources of cognitive stimulation, subsequent targeted communication with specialist management verifies specific accessibility requirements.

Social Media as a Tool for Network Influence and Power Motivation

Activity on social media within the TwANs group exhibits traits of McClelland's power motivation (nPow), representing a desire for control, self-determination and the ability to inspire others through shared experiences. Respondents repeatedly highlighted WhatsApp and X (formerly Twitter) posts by acquaintances capturing authentic Serengeti moments, which enhanced the destination's credibility and perceived safety. Credible user-generated content (UGC) acts as a catalyst, transforming passive recipients into active travellers. Once TwANs complete their visit, they share experiences via WhatsApp and X, becoming influential nodes within the community and disseminating specific knowledge about Serengeti logistics, Ngorongoro infrastructure or Zanzibar services.

Virtual Communities (TripAdvisor) and the Dynamics of Trust

TripAdvisor plays a significant role in satisfying McClelland's

need for affiliation (nAff), which emphasises the human striving for integration and empathy within a social group. Sharing experiences creates virtual networks where users identify with reviewers facing identical physical or sensory barriers. The platform's interactive features foster long-distance relationships and provide essential social proof, which TwANs depend on during itinerary planning via mobile devices.

From a destination management perspective, this open digital dynamic is a double-edged sword. A tour operator representative (TOP02) emphasised that although TripAdvisor spreads positive accessibility information globally, negative reviews have a devastating impact. For the TwANs segment, a negative review highlighting an inaccessible lodge or unhelpful staff carries far greater weight, as it represents a real risk to health or dignity in the wilderness.

Visual Narratives and B2B Platforms as Compensatory Mechanisms

Travel documentaries serve as main sources of primary information for TwANs. Participants with limited mobility highlighted productions like National Geographic programmes or the historical film *Serengeti Shall Not Die* as key sources of cognitive and emotional inspiration. These immersive formats enable people with severe physical disabilities to mentally explore destination topography before travelling, serving as a visual compensatory mechanism that makes safari tourism psychologically more accessible.

The final strategic pillar consists of traditional B2B marketing formats, specifically international tourism trade fairs. According to a travel agency respondent (TOP05), annual exhibitions in key source markets remain irreplaceable platforms for establishing personal contacts and building institutional trust. Attendance at Africa's Travel Indaba in South Africa enabled direct contact with potential visitors seeking specialist tour operators for Tanzania. This confirms that face-to-face interaction breaks down barriers of mistrust, ensuring agencies fully understand specific assistance needs within the harsh conditions of Serengeti National Park.

Marketing Materials in Tourism Information Accessibility

Analysis of empirical data revealed that marketing and promotional materials play a critical role in eliminating cognitive uncertainty for TwANs across major distribution channels:

- Websites as the primary information interface: Official websites represent a key source of primary data, eliminating the need for face-to-face interaction. Participants in the second focus group (FGD02), comprising tour guides, emphasised their global reach. A guide (FGD02P02) demonstrated, using the example of an elderly client visiting the Serengeti and Ngorongoro, that online offer comparisons and visual clarity directly determine purchasing behaviour. The inclusive nature of websites is enhanced by

integrating accessibility features, such as simplified language, visual content and short video clips.

- Multimedia brochures and leaflets: Online audits and interviews with travel agency management revealed that promotional brochures remain vital toolsets.

SWOT-R: Accessibility of Information for TwANs in Destination Management

S – Strengths

- Multimodal data structure: Travel agencies and TANAPA possess diverse materials, including websites, brochures, maps and videos.
- High visual quality: Current outputs demonstrate excellent typographical and chromatic standards with high contrast.
- Authentic audiovisual content: Integrating real-life footage and testimonials from previous disabled clients effectively builds trust (TGD04).
- Inclusive cartography: TANAPA proactively produces topographical maps adapted to basic visual impairment needs.

W – Weaknesses

- Specialised product shortage: Only 1 out of 37 surveyed operators (2.7%) actively promotes TwAN-tailored packages.
- No field tactile formats: No printed materials in Serengeti National Park are available in Braille.
- Website technological inaccessibility: Corporate websites lack audio navigation and screen-reader compatibility.
- Hearing impairment exclusion: Complete absence of sign language interpretation or subtitles at the Serengeti Media Center.
- Rigid marketing focus: Promotion targets traditional groups (families, couples), ignoring motor, sensory or intellectual disabilities.

O – Opportunities

- Niche market capture: Enormous potential for early-moving agencies communicating transparently about Tanzanian accessibility.
- Leveraging word-of-mouth (WOM): Tailored information services trigger strong referral effects within TwANs communities, satisfying McClelland needs (SNV01).
- AI technological upgrades: Low-cost integration of automatic text-to-speech readers and audio guides into websites.
- International expert partnerships: Collaborating with global inclusive tourism organisations for Serengeti accessibility audits.

T – Threats

- Pre-travel cognitive uncertainty: Unverified online information and fear of unfamiliar environments deter TwANs from travelling (Devile & Kastenholz, 2018).

- Misleading marketing reputation risks: Discrepancies between website claims and park realities trigger negative WOM, damaging operator reputations.

- Widening digital divide: Rapid technology development without implementing accessibility standards (e.g. WCAG) further isolates disabled users.

Framework for Measures in the Application of European Accessibility Standards

Applying European regulations like the EAA, standard EN 301 549 and WCAG guidelines serves as a strategic best-practice model for Tanzania, transforming communication gaps into specific technological measures across five key pillars:

- **Digital interface harmonisation (WCAG 2.1 Level AA):** Websites and booking systems are technically adapted to global POUR principles (Perceivability, Operability, Understandability, Robustness), ensuring keyboard navigation and full screen-reader compatibility.

- **Audiovisual multimodal transformation:** TANAPA is implementing multi-channel perception at the Serengeti Media Center, requiring synchronised subtitles, text transcripts and audio descriptions for all videos.

- **Accessibility Statement implementation:** Operators integrate structured accessibility documents specifying the actual extent of safari accessibility (e.g. adapted vehicles, lodge layouts) and providing direct feedback channels.

- **E-commerce and PDF/UA accessibility:** Product portfolios move towards inclusive products. Digital brochures, contracts and e-tickets are generated exclusively in PDF/UA format for flawless assistive technology processing.

- **Communication diversification and tactile alternatives:** Customer services introduce real-time text alternatives (e.g. live chat). Concurrently, TANAPA translates park architecture into tactile relief maps and Braille brochures at permanent distribution centers.

Areas where European Standards Directly Address Critical Shortcomings in the Serengeti National Park

1. Addressing Cognitive Uncertainty: Accessibility Statement

The greatest barrier for TwANs is the lack of verified information. The European model replaces vague marketing claims with precise data.

- **Serengeti Shortcoming:** The official website only uses general, unverified phrases such as ‘wheelchair friendly’.

- **EU Standard Application:** Mandatory introduction of a precise, technical safari profile based on a standardised European template.

- **Practical Implementation:** Profiles specify transport logistics (vehicle types, door width in centimeters, hydraulic platforms) and accommodation details (bed height, bathroom door width, walk-in showers). It includes a feedback mechanism via an accessibility coordinator with a guaranteed 24-hour response.

2. Terrain Compensation: Digital Accessibility and Assistive Technologies (WCAG 2.1 & PDF/UA)

Since TANAPA cannot build invasive asphalt infrastructure in sensitive habitats, information systems must be 100% accessible to digitally compensate for physical limitations.

- **Serengeti Weakness:** Information resides in inaccessible scanned brochures and websites lacking alternative text descriptions.

- **EU Standard Application:** Transitioning to POUR principles in accordance with technical standard EN 301 549.

- **Practical Implementation:** Photographs receive descriptive alt tags (e.g. "Photograph: An open-top off-road jeep with a ramp..."). E-contracts, route maps and e-tickets use PDF/UA format. Asynchronous text interfaces (Live Chat, WhatsApp Business) eliminate telephone verification.

3. Multimodal Transformation at the Serengeti Media Center

The visitor center currently provides monomodal information, limiting access for various TwAN groups.

- **Serengeti Weakness:** Documentary films and lectures systematically ignore the needs of deaf and blind visitors.

- **EU Standard Application:** The EAA mandates three parallel layers of perception for audiovisual content.

- **Practical Implementation:** Media presentations include synchronised closed captions, text transcripts and audio descriptions, complemented by tactile relief maps at key entry points like Naabi hill gate.

4. Economic, Social and Reputational Benefits for Tanzania

Implementing these standards prevents 'accessibility washing' and secures sustainable access to the affluent European market, opening doors for EU development grants. Social benefits include a leading reputation in sub-Saharan Africa. This study proposes a three-pillar action framework: (1) a WCAG 2.1 website audit checklist, (2) Easy-to-Read text templates for park rules, and (3) standard technical specifications for safari vehicle modifications.

5. TwANs Satisfaction Measurement Methodology (Post-visit Evaluation)

To verify implementation benefits, a specialised evaluation questionnaire combines technical parameters with emotional perceptions of accessibility, monitoring three key metrics:

- **Cognitive Confidence Index (CCI):** Measures if pre-trip information accurately allayed fears about unfamiliar terrain (Likert scale 1–5).

- **Technological Accessibility Rate (TAR):** Percentage of clients booking online via assistive technology without third-party intervention (target > 95%).

- **Net Promoter Score for accessibility (aNPS):** Measures destination recommendation willingness.

Discussion

The study found that word-of-mouth (WOM) recommendations are highly effective in sharing tourism information with TwANs, particularly for ensuring essential items are included in travel packages. However, their impact depends on high-quality service provision. Additionally, the internet serves as a key tool for TwANs searching for travel agency offers. Supporting this, Hootsuite (2022) noted that online platforms are essential for searching information, making travel decisions and communicating with service providers and other travellers, highlighting the central internet role in modern tourism.

Somnuxpong and Wiwatwongwana (2020) previously found that information accessibility must be ensured online, accounting for perceptual, sensory, motor and cognitive disabilities. Technologies like screen readers, speech recognition and Braille displays enable people with disabilities to access information effectively. The Web Accessibility Initiative (WAI) enhances website flexibility, emphasizing accessibility guidelines. These requirements are directly addressed by European digital criteria in the EN 301 549 standard and WCAG 2.1 Level AA guidelines. These standards require strict adherence to the four fundamental POUR principles (Perceivability, Operability, Understandability, Robustness), meaning Tanzanian operators must ensure full keyboard navigation, adequate colour contrast and 100 per cent compatibility of booking systems with assistive technologies.

The findings also noted that using WhatsApp and Twitter to disseminate information is useful for older people or wheelchair users with limited face-to-face participation opportunities. In line with European customer support rules, departments should systematically diversify these B2C communication channels. Providing text-based alternatives (such as real-time live chat) enables individuals with hearing and speech impairments to verify specific needs with dignity prior to travel. Furthermore, TripAdvisor facilitates global travel information sharing among TwANs. In this context, social media tools like Facebook, Twitter, YouTube and Pinterest enable travellers to become content creators, sharing experiences and co-creating content while at the destination (Tussyadiah & Fesenmaier, 2009).

Documentary films are important for reaching the TwANs demographic. Xie-Carson et al. (2023) emphasised that visual information (VI) with human-like features on social media is more engaging than less human-like 2D or 3D animations. Tourism marketers can utilize advanced technologies like Meta Human Creator to create realistic VIs, making content more accessible. However, to adapt European media accessibility guidelines under the European Accessibility Act (EAA), the park authority (TANAPA) should introduce multi-channel perception within the Serengeti Media Center. Every video must include synchronised subtitles, text transcripts and audio descriptions.

Specialised exhibitions provide TwANs with opportunities to interact with operators worldwide. Somnuxpong and Wiwatwongwana (2020) noted that the Chiang Mai International Exhibition Centre offers fully accessible indoor and outdoor spaces, confirming the importance of infrastructure readiness. This destination shows that smooth surfaces, ramps, handrails and adapted information boards enable visitors with specific requirements to move independently (Somnuxpong & Wiwatwongwana, 2020).

Focus groups revealed that most tourists browse information on agency websites to familiarise themselves with travel packages. Gupta (2019) emphasises that digital marketing has transformed engagement by providing extensive information through multiple channels. Websites offer a cost-effective way to showcase destinations, holiday packages and hotel categories. Strengthening online presence enables agencies to inform customers effectively, promoting informed travel decisions (Gupta, 2019). If Tanzanian operators wish to declare compliance with the European model, they should implement a structured Accessibility Statement on their websites. This document accurately specifies the actual technical scope of safari accessibility (e.g. adapted vehicles, exact door widths) and provides direct feedback channels, alleviating concerns about unfamiliar terrain.

Brochures are essential marketing materials for disseminating accessible information to literate older people, wheelchair users and deaf people. Agencies use online and printed formats to improve access. Morgan and Pritchard (1998) noted that promotional materials—such as brochures, leaflets and booking platforms—shape visitors' destination perceptions. Pritchard and Morgan (2000) emphasised that such materials help visitors discover activities and understand local culture, highlighting their importance for diverse accessibility needs. When integrating European e-commerce standards under the EAA, digital brochures, contracts and e-tickets must be generated exclusively in accessible open formats like PDF/UA. Only documents formatted this way can be processed flawlessly by screen readers, preventing the exclusion of visually impaired people.

However, Seiver and Matthews (2016) emphasised that promotional images do not merely showcase products, but also reflect social groups and societies, sometimes drawing on racial stereotypes and cultural norms to attract specific markets.

Conclusion

This interdisciplinary study confirms that the current state of information architecture and destination marketing in the Serengeti National Park exhibits profound communicative exclusion, which marginalises the solvent and loyal segment of tourists with accessibility needs (TwANs). Traditional promotional materials and digital platforms are designed almost exclusively for the able-bodied population, which exacerbates cognitive uncertainty among visitors with sensory and motor impairments. As the strict nature conservation regime in sensitive African habitats (IUCN Category II) naturally precludes invasive physical modifications to the terrain, the solution to this shortfall lies in adopting international standards for digital and information accessibility. The implementation of the criteria of the European Accessibility Act (EAA), the technical standard EN 301 549 and the WCAG 2.1 guidelines does not, therefore, replace national legislative frameworks, but functions as an innovative model of voluntary data-based compensation. Replacing concrete infrastructure with 100 per cent information accessibility enables Tanzanian destination management to allay clients' concerns, diversify its product portfolio and transform the technological limitations of a developing country into a strategic competitive advantage on a global scale.

Based on our empirical findings, we propose that the parks authority (TANAPA) and local tour operators implement a phased model that minimises the initial financial burden. In the short term, at no cost, it is essential to switch to distributing contracts and itineraries in PDF/UA format, to structure online texts in accordance with POUR principles, and to introduce asynchronous text-based communication interfaces. In the medium term, it is recommended to bring websites into line with WCAG 2.1 (Level AA) guidelines, including the implementation of an Accessibility Statement, and to launch low-cost production of tactile relief maps for key entry points (e.g. Naabi hill gate) using 3D printing in collaboration with other stakeholders. Long-term objectives require a multimodal transformation at the Serengeti Media Center (audio description and sign language in videos), with funding to be secured through international development grants or public-private partnerships (PPPs) with European tour operators who require this accessible data for commercial purposes. These steps must be supported by certified training programmes for staff in the ethics of inclusive communication, which, in line with McClelland's theory of needs, satisfies TwANs' need for affiliation (nAff), achievement (nAch) and autonomy (nPow).

The present study faces certain limitations, which stem primarily from its exploratory qualitative design and its focus on a specific case study of a single national park. The research sample of 66 participants was assembled using purposive sampling, and although it consisted mainly of experts and institutional stakeholders, it also included 26 tourists with various forms of sensory and motor impairments. The inclusion of end-users significantly enhances the validity of the findings; however, the qualitative nature of the data and the focus on a single protected area limit the possibility of immediately generalising the results more broadly at a national level. Future academic research should overcome these limitations by conducting extensive quantitative testing with greater involvement of global associations representing TwANs. Further scientific research should focus on precise economic modelling of the return on investment (ROI) in digital accessibility within tourism, and on the potential for transferring the proposed data compensation model to the management of other protected areas and safari destinations in developing regions of the world.

Declaration of Conflicting Interests

The Author declares that there is no conflict of interest.

Funding

By project APVV-24-0101 Biosphere reserves as living labs.

Acknowledgement

The paper was supported by project APVV-24-0101 Biosphere reserves as living labs and VEGA 2/0031/23 Analysis and evaluations of the environmental history of selected types of Slovak landscape from the early prehistory to the present.

References

1. Aladwani AM, Palvia PC (2002) Development and validation of a tool for measuring website quality from a user's perspective. *Information and Management* 39: 467-476.
2. Alderman D (2013) Introduction to the special issue: African Americans and tourism. *Tourism Geographies* 15: 375-379.
3. Bayliss J, Balmford A, Schaafsma M, Burgess ND, Green JMH, et al. (2014) The current and future value of nature-based tourism in the Eastern Arc of Tanzania. *Ecosystem Services* 8: 75-83.
4. Beeton S (2005) *Film-induced tourism* (Vol. 25, Aspects of Tourism Series). Clevedon, England: Channel View Publications.
5. Berne C, Garcia-Gonzalez M, Mugica J (2012) How ICTs are changing the balance of power in tourism distribution channels. *Tourism Management* 33: 205-214.
6. Braun V, Clarke V (2022) *Thematic analysis: A practical guide*. SAGE Publications Ltd.
7. Buhalis D, Eichhorn V, Michopoulou E, Miller G (2005) *Market and stakeholder analysis from an accessibility perspective*. University of Surrey: Guildford, United Kingdom.
8. Burton D, Klemm M (2011) White people, ethnic minorities and travel advertising brochures. *The Service Industries Journal* 31: 679-693.
9. Creswell JW, Creswell JD (2018) *Research design: Qualitative, quantitative and mixed methods approaches*. 5th ed. Sage Publications.
10. Darcy S (2012) Disability, Access, and Inclusion in the Event Industry: A Call for Inclusive Event Research. *Event Management* 16: 259-265.
11. Darcy S, Buhalis D (2023) Promoting universal accessibility through tourism: From barriers to bridges. *Annals of Tourism Research* 99: 103528.
12. Del Vasto-Terrientes L, Fernandez-Cavia J, Huertas A, Moreno A, Valls A (2015) Official tourist destination websites: Hierarchical analysis and assessment with ELECTRE-III-H. *Tourism Management Perspectives* 15: 16-28.
13. Denzin NK (2012) *The research act: A theoretical introduction to sociological methods* (3rd ed.). Transaction Publishers.
14. Devile E, Kastenholz E (2018) Accessible tourism experiences: the voice of people with visual disabilities. *Journal of Policy Research in Tourism, Leisure and Events* 10: 265-285.
15. Domínguez Vila T, Alen ME, Darcy S (2020) Accessibility of tourism websites: the level of countries' commitment. *Universal Access in the Information Society* 19: 331-346.
16. Duncan A (2013) On advertising.
17. European Commission (2024) Commission Communication: Guidelines on independent living and the inclusion of people with disabilities in the community in the context of EU funding (C/2024/7188). Official Journal of the European Union.
18. Fernández-Cavia J, Marchiori E, Haven-Tang C, Cantoni L (2017) Online communication in Spanish destination marketing organisations: A perspective from practitioners. *Journal of Vacation Marketing* 23: 264-273.
19. Fernandez-Díaz E, Jambrino-Maldonado C, Iglesias-Sanchez PP, De las Heras-Pedrosa C (2023) Digital accessibility of smart cities - tourism for all and reducing inequalities: *Tourism Agenda 2030*. *Tourism Review* 78: 361-380.
20. Fernandez-Villaran A, Erice M, Espinosa N, Goytia A, Madariaga A, et al. (2021) Information about Tourism Destinations' Accessibility in Tourism Online Platforms: Is it Useful for People with Diverse Abilities? In Harju-Mylyaho A, Jutila S (eds.), *Inclusive Tourism Futures*, Chanel View Publications.
21. Gupta G (2019) The inclusive use of digital marketing in the tourism sector. In *Information Systems Design and Intelligent Applications: Proceedings of the 5th International Conference INDIA 2018*, Volume 1, 411-419. Springer Singapore.
22. Han J, Mills JE (2006) Zero acquaintance benchmarking at travel destination websites: what is the first impression that national tourism organizations try to make? *International Journal of Tourism Research* 8: 405-430.
23. Harris J, Taylor M (2021) *Inclusive marketing: Strategies for building authentic relationships with a diverse audience*. Marketing Insights Press.
24. Hays S, Page SJ, Buhalis D (2013) Social media as a destination marketing tool: Its use by national tourism organisations. *Current Issues in Tourism* 16: 211-239.
25. Hootsuite (2022) *Digital 2022: Global Overview Report*. We Are Social, Hootsuite.
26. Huang CD, Goo J, Nam K, Yoo CW (2017) Smart tourism technologies in travel planning: The role of exploration and exploitation. *Information & Management* 54: 757-770.

27. Hudson S, Ritchie JRB (2006) Promoting destinations via film tourism: An empirical identification of supporting marketing initiatives. *Journal of Travel Research* 44: 387-396.
28. Hunt CA, Gorenflo LJ (2018) Tourism development in areas of high biodiversity. *Annals of Tourism Research* 76: 320-322.
29. Kalamucki K, Czerny A (2015) The role of cartographic products in promoting tourism: the case of Rostocze. *Regional Barometer. Analyses & Prognoses* 13: 145-151.
30. Kiralova A, Pavlicecka A (2015) Development of Social Media Strategies in Tourism Destination. *Procedia – Social and Behavioural Sciences* 175: 358-366.
31. Kling KG (2024) Accessible nature: Balancing contradictions in protected areas. *Journal of Outdoor Recreation and Tourism* 7.
32. Krueger RA (1994) *Focus Groups: A Practical Guide for Applied Research* (2nd ed.). Thousand Oaks, CA: Sage.
33. Lee BK (2012) Accessible tourism in Korea. In *Proceedings of the 1st South-East Asian Conference on Accessible Tourism*. pp. 1-26.
34. Lorincz K, Lang LA, Banász Z (2019) The Image of the Lake Balaton Region from the Perspective of the Local Population. In: *Modern Geography 2019*: 1-14.
35. Lwoga NB, Mapunda BB (2017) Challenges facing accessible tourism at cultural heritage sites: The case of the Village Museum in Tanzania.
36. McClelland DC (1988) *Human Motivation*. Cambridge University Press.
37. McCabe S (2020) Tourism for all? Reflections on social tourism: a perspective article. *Tourism Review* 75: 61-64.
38. Mesquita S, Carneiro MJ (2016) Accessibility of European museums for visitors with visual impairments. *Disability & Society* 31: 373-388.
39. Morgan DL (1997) *Focus groups as qualitative research* (2nd ed.). SAGE Publications, Inc.
40. Morgan N, Pritchard A (1998) *Tourism promotion and power: Creating images, creating identities*. John Wiley & Sons Ltd.
41. Mulyaningrum NI, Lestari NS, Wiastuti RD (2018) Accessible information in tourism: Case of casual Italian restaurant. In *Proceedings of the National Conference of Creative Industry: Sustainable Tourism Industry for Economic Development* (pp. 230-240). Universitas Bunda Mulia.
42. United Nations (2018) *Report on Disability and Development*; United Nations: New York, NY, USA.
43. United Nations (2019) *Promoting accessible tourism for all*. Department of Economic and Social Affairs: Disability.
44. Persson I, Olofsson J (2020) The provision of activities adapted to the needs of people with disabilities in Jämtland County: A study of how travel agencies and activity operators work to include people with physical disabilities.
45. Porto N, Rucci CA, Simon D, Garbero N, Almond B (2019) Critical elements in accessible tourism for destination competitiveness and comparison: Principal component analysis from Oceania and South America. *Tourism Management* 75: 169-185.
46. Pritchard A, Morgan N (2000) The construction of tourist landscapes – gender, sexuality and space. *Tourism Geographies* 2: 115-139.
47. Richards B (2003) *Marketing tourist attractions. How to increase visitor numbers and revenue*. Translated by J.K. Milencki, Library of the Polish Tourist Organisation. Warsaw: POT
48. Rubio-Escuderos L, García-Andreu H, Michopoulou E, Buhalis D (2021) Perspectives on the experiences of tourists with disabilities: implications for their daily lives and for tourism. *Tourism Recreation Research* 49: 1-15.
49. Ryan C (1995) Insights into tourists from interviews: people over 55 in Mallorca. *Tourism Management* 16: 207-215.
50. Seiver B, Matthews A (2016) Beyond whiteness: A comparative analysis of representations of Aboriginality in tourism destination images in New South Wales, Australia. *Journal of Sustainable Tourism* 24: 1298-1314.
51. Sigala M (2018) New technologies in tourism: From multidisciplinary to anti-disciplinary advances and trajectories. *Tourism Management Perspectives* 25: 151-155.
52. Šimková E, Holzner J (2014) Motivation of tourism participants. *Procedia-Social and Behavioural Sciences* 159: 660-664.
53. Somnuxpong S, Wiwatwongwana R (2020) The capacity to promote accessible tourism in Chiang Mai, Thailand. *African Journal of Hospitality, Tourism and Leisure* 9: 1-16.
54. World Tourism Organisation (2021) *Guidelines for Accessible Tourism for All* (updated edition). Madrid, Spain: UN Tourism.
55. Theofanous G, Thrassou A, Uzunboylu N (2024) Digital inclusivity: Promoting accessible tourism through sustainable e-commerce and marketing strategies. *Sustainability* 16: 1680.
56. Tussyadiah IP, Fesenmaier DR (2009) Mediating tourism experiences and access to places through shared videos. *Annals of Tourism Research* 36: 24-40.
57. UN Tourism (2025) UN Tourism joins AWE in delivering practical solutions for more accessible and inclusive tourism businesses.
58. Vichivanives R, Ralangarm S (2015) A system for retrieving information about temples using QR codes via a mobile application. *Procedia Social and Behavioural Sciences* 197: 998-1005.
59. Wang W, Zhao H, Cole ST, Xun P (2020) The effectiveness of accessibility information on hotel websites: A quasi-experimental design. In *Travel and Tourism Research Association: Advancing Tourism Research Globally* (Vol. 46). Travel and Tourism Research Association (TTRA).
60. Weiler M, Whiting A, Sajid W, Dewan N, Dutta T (2024) Accessibility of national parks and other natural protected areas for people with disabilities: a scoping review of the academic literature. *World Leisure Journal* 67: 1-28.
61. Xiang Z (2018). From digitalisation to the era of acceleration: On information technology and tourism. *Tourism Management Perspectives* 25: 147-150.
62. Xie-Carson L, Magor T, Benckendorff P, Hughes K (2023) Just media hype or the real deal? Examining user interaction with virtual influencers in tourism. *Tourism Management* 99: 104779.
63. Yoo CW, Goo J, Huang CD, Nam K, Woo M (2017) Enhancing satisfaction with travel decision support using smart technologies in tourism: A framework of information processing likelihood and tourists' self-efficacy. *Technological Forecasting and Social Change* 123: 330-341.
64. Zajadacz A, Lubarska A (2020) Sensory gardens as spaces for outdoor recreation adapted to the needs of people with visual impairments. *Studia Periegetica* 2.
65. Závodi B, Szabó G, Alpek LB (2021) A survey of the consumer behaviour of tourists visiting Southern Transdanubia in Hungary. *GeoJournal of Tourism and Geosites* 34: 245-250.