Alternative ecotourism perspectives within the protected conservation sites and farming communities amid environmental degradation and climate change-bound rural exercises

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Abstract

Purpose – This study aims to examine the latent capability of alternative-responsible tourism and ecotourism management in sustainable tourism and rural communities' livelihoods in Musina Municipality in Limpopo Province, South Africa, and benchmark the capability with other African countries amid climate change and environmental degradation dilemmas. Hence, the aforementioned objective coordinates with various agrarian locations elsewhere abroad.

Design/methodology/approach – Literature reviews, document reviews, interviews, and focus group discussions were employed to gather data, which was enriched by field observation views. To this end, potential climate change-linked environmental degradation, rural tourism, agricultural, and environmental management issues came to the fore.

Findings – Environmental degradation poses a possible threat to natural resource management, as evidenced by the rural development, ecotourism and agricultural activities within the study region. Thereupon, environmental degradation supplements the probability of adverse effects from climate change and precarious incomes. According to the research, responsible tourism and ecotourism are vital to promoting sustainability in rural localities.

Originality/value – The plenteous biodiversity of the municipality offers a better scenario for sustainable ecotourism in tandem with agritourism efforts to address the identified ongoing and liability issues. These issues have therefore symbolized the need for an adequate and allied tourism strategy to boost the local people in Musina Municipality and, conceivably, throughout the continent.

Keywords Environmental degradation, Climate change, Ecotourism, Environmental management, Agritourism, Responsible tourism and sustainability

Paper type Case study

The author profoundly recognizes the editors and anonymous reviewers for their oversight and direction on the manuscript. The original eco-tourism management, environmental change, and agroforestry credentials from the University of Pretoria Tourism Management Division and Centre for Environmental Studies extended this appropriate examination and are worth acknowledging. Hereafter, they unitedly appraised the value of trees outside the forest and the entire biodiversity for livelihoods and sustainability. Biogeography, rural development geography, and conservation biology certifications from the University of Venda Environmental Sciences School and Biological Sciences Department furnished in-depth knowledge, as did all research participants in the study area. SANSA Earth Observation is duly approved for the appropriation of this survey.

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1. Introduction

Ecotourism concerns natural resource-based entertainment and links to climate change in myriad ways, including its potential direct impacts through environmental degradation, vehicle trails, and polluting behavior from tourism and the locals (Mandić and McCool, 2023). Likewise, greenhouse gas (GHG) emissions emanate from variable land use activities and forest livelihood exercises and are notable contributors to climate change (Jiang and Green, 2017). Analogous to the current pandemic's threat of coronavirus disease (COVID-19), climate change influence has always had the potential to have an adverse impact on global tourism, the hospitality industry, and the sustainable development of communities (Yiwei *et al.*, 2022). According to Rogerson and Rogerson (2021), the global outbreak of COVID-19 has had catastrophic effects on South Africa's tourist industry. As a result, the country's government has been developing measures for a recovery strategy. Similar to other nations, the marketing of local tourism is a critical priority. There has been an indication of imbalance and diminished confidence among local enterprises and the national leadership, given the adverse economic impacts of COVID-19 on local tourist establishments and the South African government's steps for alcohol restrictions and beach shutdowns (Rogerson, 2021). Countless rural neighborhoods in Southern Africa and Africa exhaustively occupy low-income precincts; Musina Municipality is no different. Such regions are abundant with natural biodiversity and tourism initiatives. Thus, this study intends to dissect the latent integrated rural development approaches (IRDAs) of farming communities abutting protected areas in the study area and the synergies of alternative and responsible tourism initiatives. Hence the essence of sustainable ecotourism management and agritourism endeavors to adapt to climate change dilemmas. To this end, related studies within the same vicinity of Vhembe district in Limpopo province, such as Marubini (2018), remind us of the essence of exploring the effect of climate change on the farming business in the Nwanedi Irrigation Scheme in Musina Local Municipality. It is akin to Kativhu *et al.* (2020) and Lebepe (2022) on agricultural stability under rising water security dangers for smallholder farming and water security at the Nwanedi irrigation scheme within the precinct in the province. Besides, Shikwambana *et al.* (2021) scrutinize the effects of rainfall and temperature shifts on smallholder agriculture within the setting. It was determined that climate change, unreliable sources of irrigation, and drought impacted employment failure in the farming corporation. The cited article highlights the significance of integrated stakeholder engagement in combating climate change. Hence the credible views on relevant bureaus, adaptation interventions, and reinforcement approaches (Sitholimela, 2007; Ubis, 2016; Rankoana, 2021). Thus, tourism stakeholders and responsible tourism rationales bear educational awareness on environmental degradation and climate change, highlighting the benefits of sustainable tourism in agritourism and ecotourism within these farming communities adjacent to the protected area of Nwanedi nature reserve and its neighboring rural entities in the study region. As a result, the supplementary and alternative sources of revenue from tourism activities can aid with the adaptive strategies for climate change within the region. However, the establishment and development of ecotourism do not necessarily only carry buoyant rural land adaptation and linked advantages to the country's society but also diverse challenges. It necessitates dedicated measures from communities and different role players for sustainability endeavors. As was already implied, this study, like earlier ones, aims to fill in the knowledge gap in academia by laying out an appropriate, all-encompassing strategy for environmental sustainability and livelihoods in the face of climate change in the study zones. The previous examinations dwelled mainly on rising temperatures and rural water management crises in smaller-holder farmers' mitigation and adaptation to climate change, highlighting the need for various stakeholders and integrated development plans (IDPs), entailing super resource use plans for municipalities and their citizens stakeholders in such duties. However, they fail to pinpoint the role of alternative, sustainable tourism ideals.

Henceforth, the adaptive mechanisms of sustainable ecotourism management and agritourism are vital. Therefore, "agritourism" concerns any agriculturally established procedure or activity that brings visitors to a farmstead or ranch. Thus, it is imperative to capacitate rural farming communities dwelling adjacent to conservation areas. For example, tourism and agriculture require a decent water supply in the vicinity, which prioritizes responsible tourism and assists in managing water crises that benefit water and agricultural management in rural neighborhoods. Due to their dynamic nature and good resonance with other stakeholders, such as water affairs and agricultural divisions, sustainable ecotourism management and conservation ambitions can act as apt catalysts for sustainability in rural areas. This research makes the case that ethical and responsible tourism and well-thought-out ecotourism initiatives can serve as an alternative strategy to address environmental issues related to climate change in pastoral communities and nearby protected rural areas. The potential shortage of environmental management and sustainable tourism education within the given dimensions is where the problem statement dwells. Hence the research question is: How acquainted are the rural residents and farming communities, including protected area-based personnel, with alternative-responsible tourism as a panacea to environmental degradation and climate change-bound activities? Henceforth, a crucial sustainable ecotourism management route towards sustainability within their environs is a bona fide prospect within such a possible paucity. The effects of natural resource modifications on a visitor's recreation adventure may affect decisions about diverse implications for ecotourism and destination areas (Richardson and Loomis, 2004). Such changes may have an impact on rural communities' tourist and livelihood plans, including hotel operations.

1.1 Theoretical basis and literature exploration

Fields (2005) asserts that, in general terms, Africa is considered to contribute the least of any continent to global warming, and knowledge of advanced ecotourism management and environmental sustainability can support maintaining such statistics and improving them. Indeed, Higham (2007) asserts that while endeavoring to comprehend the complex tourism spectacle, there is an imperative need for cooperation among allies towards scrutinizing the affinity between ecotourism initiatives and climate change dilemmas. It, therefore, necessitates adaptive strategies to address a changing climate and local communities' economic activities. Thus, better tourism investigation in sustainable tourism and ecotourism management proffers profound opportunity for the tourism and hospitality industries to diminish tourism's contribution to climate change and thus reduce carbon emissions (Ramaano, 2008; Becken, 2008). Admittedly, Wearing and Neil (2009) view climate change as one of the biggest hurdles to a valuable and successful ecotourism product in both developed and developing countries' biodiversity and conservation spots. Accordingly, climate change commonly entails long-term changes in temperature and weather patterns due to natural or human-induced activities. As an epitome and a benchmark for other countries (Okech, 2009), it was revealed that the Kenya National Ecotourism Conference was held in 2007 in Nairobi, furnishing the tourism industry and communities in Kenya with a prospect to acquaint themselves with climate change as it correlates to tourism initiatives. Thus, ecotourism is responsible travel to natural areas that preserves the environment and enhances the well-being of the local society. However, ecotourism is not immune to diverse confrontations with sustainability. One such conundrum is an imminent contribution to climate change if not well-designed and carefully implemented. Meanwhile, Buckley (2009) reckons that one of the challenges in analyzing the net impact of ecotourism products concerning environmental sustainability is their definitions and descriptions of eco-labels. In view of this, other tourism retailers brainwash customers into believing dismal effects are diminished by ecotourism rationales. Some businesses even wrongfully disguise their game farms as ecotourism

products, misleading significant statistics along the way. Hall (2010) reminds us of the essence of 2010s United Nations International Year of Biological Diversity (UNIYBD) in tandem with the essential goal of reducing the rate of biodiversity loss. Thus, he further emphasizes the role of tourism developments in nature as integral to biodiversity loss, conservation, and ecotourism management. Relatedly, Campbell and Ortiz (2011) opined on the need to appraise and reconcile a gestalt of agriculture, conservation, and ecotourism for livelihoods with a case study of Central America and the Caribbean. Hence, climate change implications are a significant aspect that needs consideration for ecotourism and agritourism planning in line with climate change dimensions. The concept of a green economy renders tourism, hospitality retailers, and ecotourism goals an opportunity to confront the double challenges of sustainability achievements and the consequences of climate change worldwide (Crawford and Sternberg, 2015). To this end, Gale and Hill (2016) caution that ecosystem biodiversity is a treasure as an ecotourism resource and that its significance should be efficiently communicated to tourists and local communities to maintain environmental sustainability and subdue climate change contributions from tourism activities. Similarly, Doyle (2016) urges that ecotourism imports, climate change, and environmental sociology constitute crucial, comprehensive, and inclusive issues across the globe. According to Mondino and Beery (2019), ecotourism is a type of tourism that occurs in natural locations, maintains local communities, and involves an educational adventure. Hence, it is an ideal mechanism to bolster the linkage between biodiversity conservation, sustainable development, and mutual local community empowerment in rural and urban tourism (Ma *et al.*, 2019; Tohani, 2021; Buhalis *et al.*, 2023). To this effect, Zhong *et al.* (2019) cautioned that climate change is a critical environmental aspect impacting the sustainable development of tourist destinations. Hence, it compromises the three pillars of ecotourism and sustainable tourism. The three ideals of ecotourism are thus similar to those of sustainability and responsible tourism in terms of social, economic, and environmental integrity (Ramaano, 2021a, b). Analogously, with the Costa Rica case study, Little and Blau (2020) indicated that the country moved primarily from an agricultural economy to a service sector-driven market with a strong focus on tourism. Further evidence indicates that rural communities, originally dependent on agrarian livelihoods, face double stressors: economic pressure from declining crop prices and the heightened consequences of climate change. The aforementioned scenario is likened to many developing countries, such as the pertinent region of Limpopo, South Africa. Similarly, Amici *et al.* (2021) assert the significance of imparting knowledge to the local communities regarding the patterns of sustainable adventure tourism and nature-based tourism to combat the dismal effects linked to their land development, forest fragmentation, and climate change and empower them. Per Hasana *et al.*'s (2022) bibliometric review of ecotourism as a mitigation strategy in foreign protected areas, this paper makes adequate contributions to the body of literature. References to ecotourism destinations in China and South Africa were made (Hasana *et al.*, 2022). Also in Heffernan (2022), planning for climate change in community-based natural resource management and insights on wildlife conservation in Namibia, De Witt (2011) provided a case study of South Africa that uses the country's public parks to promote ecotourism. However, within the pertinent municipality and the abutting communities of the Mapungubwe cultural landscape and national park, Makwela (2022) forewarned us of the possibility of ecotourism contributing to environmental degradation and fueling climate change. Environmental degradation naturally entails weakening the environment through the exhaustion and insufficiency of resources such as water, air, soil, and vegetation, the ruin of ecosystems, and the extinction of wildlife. To this end, if forest park development and livelihood strategies do not embrace the ideals of responsible tourism, they will very much become a reality (Shuifa *et al.*, 2011; Zong *et al.*, 2017). Similarly, unsustainable agricultural activities have been detected to contribute to environmental degradation and climate change in the area (Anim and Chauke, 2014).

1.2 The nexus of ecosystem services, rural livelihood assets, and sustainability paragons

Ecosystem services are the numerous and assorted uses of humans furnished by the natural environment and beneficial ecosystems. Such ecosystems incorporate, for instance, forests, agroecosystems, grassland ecosystems, and aquatic ecosystems (McNeely and Scherr, 2003). Given these, agroecosystems entail the essence of agroecology and agroforestry. Thus, agroecology is a comprehensive mixed practice that simultaneously involves ecological and social conceptions and codes for the layout and management of sustainable agriculture and food systems. Henceforth, agroforestry concerns land-use systems incorporating woody perennials with crops and animals, striving for beneficial ecological and economic interactions for food, fiber, and livestock production. To this account, agroforestry possesses an essential facet of the agricultural products that translate to the success of agro-tourism, ecotourism management, and sustainability in rural localities (Ramaano, 2023a, b). The ecosystem services operate in wholesome connections and proffer such items as pristine air, bad weather comfort, biological pollination of crops, human cognitive and physical well-being, and sustainable livelihood diversity. The ecosystem services are classified into four overall categories (Power, 2010). These are: provisioning, e.g. food and water production; regulating, such as the management of climate and infection; supporting, e.g. nutrient cycles and oxygen production; and cultural, such as spiritual and recreational advantages (Maes *et al.*, 2016). To this end, estuarine and coastal ecosystems are both marine ecosystems. The specified services accomplish the four ecosystem services in many modes: supporting services of coastal ecosystems incorporate nutrient cycling, biologically impeded habitats, and primary production to foster sustainability (Huang *et al.*, 2013; Wood *et al.*, 2018). Henceforth, regulating services comprise climate regulation, waste treatment, disease regulation, and buffer zones. Therefore, provisioning services incorporate forest spin-offs such as timber, raw materials, marine products, fresh water, and biochemical and genetic resources (Maes *et al.*, 2020). With that, cultural services of coastal ecosystems comprise enticing aspects, recreation, and tourism, including science and education (Ramaano, 2021c, d, f, g). Furthermore, via cultural heritage themes and resources, they harbor crucial ingredients for eco-tourism developments and livelihoods in host destination spots (Bennett *et al.*, 2012; Juliana *et al.*, 2023). The conservation of sustainable ecosystem services is critical for human survival, and ecosystem service deterioration is a dominant phenomenon universally that leads to the conversion of lands and gloomy ecosystem benefits (Song and Deng, 2017; Ma *et al.*, 2018; Wu *et al.*, undated). Henceforth, detrimental land use change (LUC) impacts the livelihoods and well-being of society by altering ecosystem provisioning services (Deng *et al.*, 2013). Accordingly, revamped environmental quality and a climate change-conscious livelihood framework strategy should be priorities. Analogously, the fundamental notion of sustainable livelihood practice is centered on five crucial posts (Tao and Wall, 2009). Hence, such pillars are livelihood assets: human capital, social capital, physical capital, natural capital, and financial capital (Rakodi, 1999; Tabares *et al.*, 2022), and they are elemental to the poor, ethnic, and local communities (Liu *et al.*, 2022). Implicitly, the sixth capital outside the major five is intellectual capital, which is vital to indigenous knowledge and natural resource management for the locals. Thus, the cited capital framework can be valuable in natural resource management (NRM) (Omara-Ojungu, 1992), biodiversity, ecotourism, and agro-tourism integrated rural development initiatives within the impoverished communities in the study area, and combating climate change to improve livelihoods and environmental sustainability (Ramaano, 2022c, e). The next part presents the study area and methods.

2. Study area and methods

2.1 Study area

Musina Municipality is a part of the Vhembe District Municipality. It is in the backwoods of the north-eastern component of the Limpopo Province, proximal to Zimbabwe in the north

and Mozambique on the east side, adjoining the Kruger National Park. Therefore, to the more distant north of the municipality is Musina Town, bound to Thulamela Municipality. It is, respectively, located within 22° 25′ 00″ and 22° 50′ 00″ E lines of latitude and between 30° 20′ 15″ and 31° 01′ 22″ S lines of longitude. See Figure 1 for the area map (Musina Municipality, 2019; Ramaano, 2021a, b, c, d).

Therefore, Figure 2 shows smallholder irrigation schemes around Musina municipality in Limpopo province, and Plate 1 shows the struggling Paw plantations in the dry land of Zwigodini. That being so, the north-western border of Musina correlated with the privilege of patches of tomato crop. The southeastern periphery of Musina Municipality harbors patches of tomato and citrus production. To that end, fruit and vegetable processing equipment is available in Musina Town. Tiger Food Brands is substantially linked to producing tomato pastes. It is consequential as it sources its natural supplies from the regional tomato farmers, sustaining local tomato deals for the local communities and their residents (Ramaano, 2008, 2021a). Citrus products are obtainable throughout the nearby Dzanani territories. A pattern uniting conservation, agricultural production, and tourism development objectives is a static overview of Musina Municipality. To this effect, conservation agriculture (CA) is a farming system that can prevent casualties on arable land while restoring degraded lands. It stimulates the maintenance of a permanent soil cover, minimum soil disruption, and diversification of plant species. Henceforward, eco-agriculture refers to a method of managing landscapes to fulfill three goals of sustainability simultaneously and in line with sustainable rural tourism, and agro-tourism is imperative to climate change mitigation (Charles *et al.*, 2014). Therefore, preserve biodiversity and ecosystem services, furnish

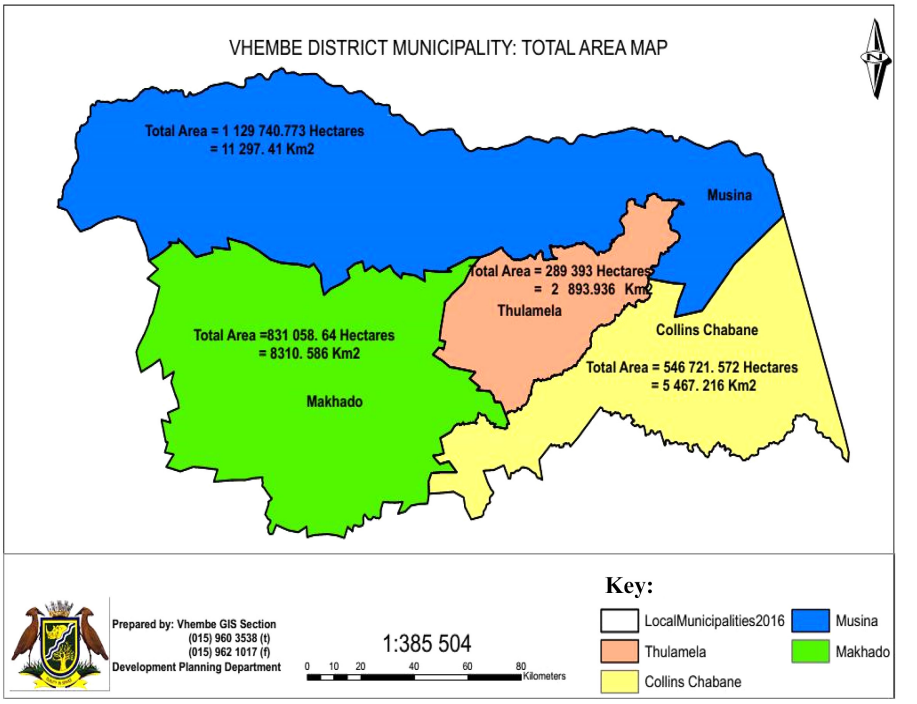
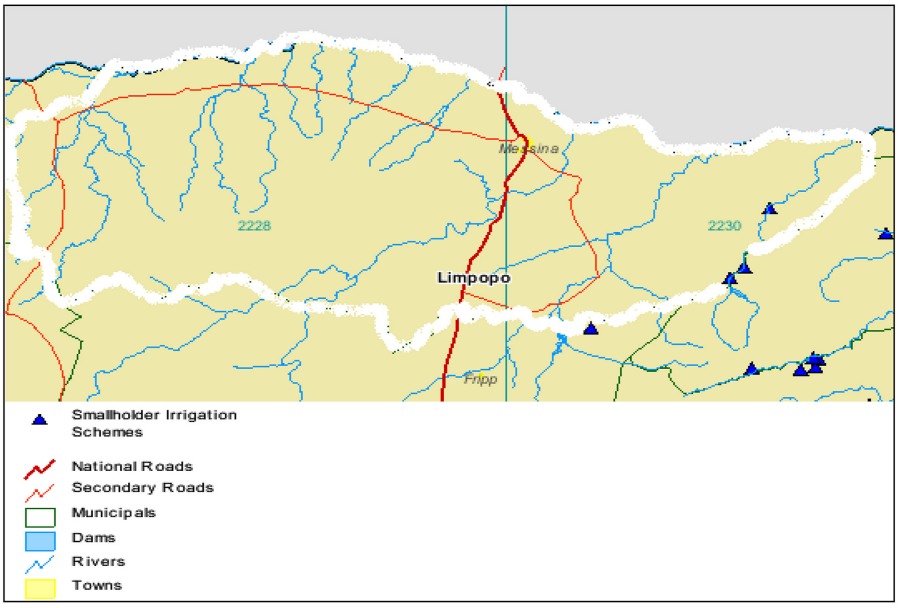


Figure 1.
The location of Musina municipality

Source(s): Vhembe district municipality, 2017



Source(s): Musina Municipality, 2019; Ramaano, 2023a

Figure 2.
Smallholder irrigation schemes around Musina Municipality in Limpopo province

Source(s): Author field observation, 2019; Ramaano, 2022b

Plate 1.
Showing struggling Paw paws plantations in the dry land of Zwigodini village

agricultural products, and sustain sufficient livelihoods for local people, including agritourism and ecotourism initiatives. As such, permaculture is an approach to land management and compensation strategy that embraces configurations kept in flourishing natural ecosystems (Epuran *et al.*, 2020). All the mentioned efforts seek to enhance agricultural production and rural livelihoods, mimic the natural environment, and mitigate

dismal environmental consequences that have implications for polluting underground water systems, ecosystem integrities, and potential climate change impacts. However, apart from their central objectives, their beauty and overall outlook, in turn, are luring aspects for tourists (Ip-Soo-Ching and Veerapa, 2013). For example, contour plowing is designed to minimize soil erosion, but it can be eye-catching in the eyes of visiting agro-tourists. Suffice it to say that the success of farming products will not only benefit farmers and agritourism but also translate to ecotourism management through feeding agricultural produce to their hospitality and cuisine outlets to foster sustainability in those regions. To this effect, tourists come, partake in farm activities, buy the commodities, and even stay in cottages, thus enabling a secondary source of revenue for farm implements and funds to combat climate change problems (Ramaano, 2021a, d). It relates to opportunities and hindrances for smallholder farmers within the district. Therefore, it is significant in facilitating farmers' participation in off-farm revenue generation actions and devising access to recognition services, eventually diminishing the financial constraint of buying and maintaining the latest farming technologies and enhancing the chance to combat climate challenges (Baloyi, 2010; Maponya, 2021). Therefore, the three rationales of sustainable tourism are akin to those of sustainable agriculture in terms of social, economic, and environmental efficiencies. Accordingly, it manifests the role of biophysical resources and ecosystem services in livelihoods and holistic rural development (Mavhungu *et al.*, 2021).

2.1.1 Rural ecotourism, agrarian, campestral enterprises. There are already existing ecotourism and agritourism marks in the Musina municipal expanse. They include Nwanedi Resorts, Tshipise Sagole, and Folovhodwe Nwanedi agricultural projects. Plate 2 displays the signage board of the Nwanedi dam in the Nwanedi resort around Folovhodwe (Tanda) village. Therefore, (Plate 3) shows a degraded patch and damaged fence inside the Big Tree Nature Reserve in Madifha (Zwigodini) village.

2.1.2 Tourism, hospitality, and rural development activities. The study discloses that the municipality has the convenience of having many tourism enterprises. They comprise the Big

Plate 2.
Signage board of Nwanedi dam in the Nwanedi resort around Folovhodwe (*Tanda*) village

Source(s): Author field observation, 2019

Source(s): Author field observation, 2019

Plate 3.
Showing degraded patch and damaged fence inside the big tree nature reserve in Madifha (*Zwigodini*) village

Tree Accommodation Lodge, Nwanedi Nature Reserve, and Domboni Caves. Yet Musina Municipality and Musina Town maintain other tourist magnets. These include Baobab Chalets, Bush Babe, Baobab Caravan Park, Limpopo River Lodge, Tshipise Forever Resort (TFR), Big Tree Nature Reserve (BTR), and Mapungubwe National Park (MNP) (Ramaano, 2008, 2021a).

2.2 Data and methods

To assess the "environmental degradation and climate change-bound tourism exercises: alternative ecotourism management perspectives within the rural conservation sites and farming communities in Musina Municipality, Limpopo, South Africa," the study's methodologies were put to use. As shown by the data in Tables 1 and 2 on the demographics of the municipality and the study region, the prior study that serves as the foundation for this current investigation successfully used a mixed-methods design with questionnaire surveys predominating. All ethical research practices and recognitions were recognized in the methodology, which protects the validity of this study. Purposive sampling was used in the related earlier research instead of stratified sampling. As a result, this research supports typical purposive sampling based on subject-matter expertise and background in the area, consistent with the main study. As such, the research methods for the current examination included focus group discussions, field observations, a literature review, and interviews. The sampling process was carried out to find a representative entity with a logical mind (Patton, 2001). The sample size was determined using Taro Yamane's formula (Yamane, 1973). $\mathbf{n} = \mathrm{N}/(1 + \mathrm{Ne}^{2})$, where **n** is the sample size, **N** is the population size; and **e** is the precision level. The sample size of the study area was determined as follows:

Villages	Population	Calculation formula and percentages	Sample size
Folovhodwe	2,806	57% × 370 = 210.9 (Rounded to 211) = 211	211
Gumela	383	8% × 370 = 29	29
Tshipise	1,052	21% × 370 = 77.7 (Rounded to 78) = 78	78
Zwigodini	706	14% × 370 = 51.8 (Rounded to 52) = 52	52
Total	4,947	100%	370

Source(s): Musina Municipality, 2011/2019

Table 1.
Selection of villages and calculation of original sample size

Table 2.
Age group and gender profile for Musina municipality

Age group and gender for the respondents				
Age group		Female	Male	Total
11–19	Count	32	21	53
	%	60.3%	39.6%	100.0%
20–35	Count	44	50	94 (25.4%)
	%	46.8%	53.1%	100.0%
36–45	Count	31	63	94 (25.4%)
	%	32.9%	67.0%	100.0%
46–65	Count	41	44	85 (22.9%)
	%	48.2%	51.7%	100.0%
65+	Count	17	27	44 (11.8%)
	%	38.6%	61.3%	100.0%
Total	Count	165	205	370 (100%)
	%	45.5%	54.4%	100.0%

Source(s): Survey by the Ramaano (2021a)

$$\mathbf{n} = \mathrm{N}/\left(1 + 4947\,\mathrm{x}\,0.05^2\right)$$

$$\mathbf{n} = 4947/(1 + 4947\,\mathrm{x}\,0.0025)$$

$$= 370.0766$$

$$= \mathbf{370}$$

The presented study area encompasses Folovhodwe, Gumela, Tshipise, and Zwigodini villages in Musina Municipality and possesses 4,947 inhabitants. Accordingly, the sample size was decided at 5% (**e** = 0.05), and the sample size of the study area was literally around 370. The livelihood deprivation and conditions of the communities close to the protected areas and environmental degradation patches within the region and surrounding areas led to the study area's choice. Consequently, four villages were represented and thoughtfully set (Ramaano, 2021a). They are Folovhodwe, Gumela, Tshipise, and Zwigodini, all abutting several tourist realities, such as the Nwanedi Nature Reserve and the "Big Tree Nature Reserve" among the rest (Table 1). Hence, Table 1 confirms the original sampled area and sample size: four focus group discussions were aired with 20 participants (5 per 4 villages) within the sampled residents in the Musina municipal site. For interviews, 30 participants (5 per 6 ventures and entities within the selected villages) shared interviews from assigned questionnaires on tourism entities' personnel.

Per the context of the study, primary and secondary methods were applied. As such, (a) literature reviews, (b) document reviews, (c) interviews, and (d) focus group discussions, augmented by field observations, gathered the information. Because of this, interviewees and participants had options for gathering times; some chose morning meetings, while others chose afternoon ones, per previous orders. Additionally, a variety of topics influenced study meetings. Closer areas received morning slots for the entire inquiry procedure, while those too far away received midday slots. Data was collected from nearby tourism businesses as well as local populations. The study's data are immediately accessible from the literature review and include an evaluation of existing documents (conducted between March 2019 and October 2021). Interviews (n = 30) (interviews within the specified adjacent tourism ventures and entities in the sampled villages [mornings and afternoons] 17/18/19/20 March 2019), focus group discussions (n = 20) (focus group

discussions within all the sampled villages [mornings and afternoons] 17/18/19/20 March 2019), and field observations (conducted alongside focus groups in March 2019) freely supplemented the more initial data. Alongside the grounds for literature review as a methodology in this study, Paré and Kitsiou (2017) contended that narrative literature reviews could spark research arguments by recognizing discrepancies in a body of knowledge. Thus, a literature review analyzes academic expertise on a matter with relevant opinions, methods, and voids in the actual study (Knopf, 2006). Henceforth, according to Rowley (2012), interviews are typically applied in qualitative research. Thus, the researcher is intrigued by compiling evidence or acquiring insights into ideas, perspectives, approaches, manners, ethics, or foresight (Hannabuss, 1996; Roulston, 2014). According to Jackson (1998), focus groups are records of group interviews used broadly in social science research as the primary data source. Typically, focus group discussions are on beliefs, practices, opinions, thoughts, and details on an appropriate subject (Moretti *et al.*, 2011; Hennink, 2013). Thus, alongside the literature review and interviews, they were also fit for responsible tourism, alternative tourism, agricultural purposes, ecotourism management, and sustainability issues within the study area. Hereafter, field observation is a requisite and essential tool in data assemblage as it furnishes the first-hand perception of data through actual codes and physical impressions. It can be the central method in a project or one of the particular determinate and complementary qualitative methods (Ciesielska *et al.*, 2018). In the applicable study, it was thus complementary to getting an exact sketch of objects. Accordingly, it delivered the precise layout of the physical terrain and biodiversity situation (e.g. Plates 3–5). Primary sources were developmental sources, such as observer reports of events (focus group discussions). Consequently, secondary sources were somewhat sequestered from primary sources and contained descriptions from people who were not direct informers (literature review [with existing document reviews]) (Esterberg, 2002).

2.2.1 Required data and their duty. Data on demographics was vital within the study area and limited to gender profiles. Data on the awareness of responsible and alternative tourism in sustainable tourism, rural and NRM tourism, local community development, and tourism exercise information in the Musina Municipality were crucial. Accordingly, the potential effects of better ecotourism management, sustainable agricultural systems, and agritourism connected to rural tourism development undertakings on the local communities of Musina Municipality were collected. The mentioned data were gathered to assess how the municipality urges various sustainable tourism enterprises, thereby raising consciousness about the latent essence of responsible tourism, ecotourism management, and integrated rural development ambition applications. Eventually, such data were the critical indicators in the probed quest, including ecotourism-oriented tourism for local community betterment in the Musina municipal area. The next segment presents the results and discussions of the study.

3. Results and discussion

3.1 The demographics of the respondents

Consistent descriptive statistics and demographics are essential in determining the shape of society. There are 54% men and 46% women in the study region. In the main study, 50.8% of respondents were between 20 and 46. Thirty-five (35%) age groups of respondents fell into the 46–65+ age range (Ramaano, 2021a). The age distribution and gender makeup of the Musina municipality's population are shown in Table 2. Optimal and sustainable usage of tourism-oriented and integrated livelihood activities can empower active members of society regardless of their age group and gender status in the area.

3.2 Gender and the respondents

According to Ramaano (2008), Musina Municipality formally comprises 43.4% female-headed households and 56.6% male-headed families. It is thus roughly balanced with Ramaano's (2021a, b, c, d) findings. That symbolizes an irregular but evident inequality among women and men, primarily the youths in the study area. Accordingly, within the subsample and interview respondents, 13 (43%) were men, while 17 (57%) were females (n = 30). To this end, and within the focus group discussion, 8 (40%) were women and 12 (60%) were males (n = 20). Table 3 presents the gender profile of the focus group discussion, and Table 4 shows the interviewees' gender profile. Women were better represented within the conservation and tourism entities' interviews than they were in the villages' focus group discussions.

3.3 Existing document and literature reviews, and inclusive primary data

3.3.1 Integrated livelihood implications in Musina municipality, South Africa, and Africa. Integrated rural development ambitions can open the way for tourism and agricultural projects for community development and subsistence. Hence, this review is among the first to

Table 3. Focus group discussion gender profile

Villages		Gender profile for focus group discussion Male	Female	Total
Gumela	Count	4	1	5
	%	80.0%	20.0%	100.0%
Folovhodwe	Count	2	3	5
	%	40.0%	60.0%	100.0%
Tshipise	Count	3	2	5
	%	60.0%	40.0%	100.0%
Zwigodini	Count	3	2	5
	%	60.0%	40.0%	100.0%
Total	Count	12	8	20
	%	60.0%	40.0%	100.0%

Source(s): Focus group discussions by the Author, 2019

Table 4. Interview gender profile

Tourism ventures and entities		Gender profile of interviewees Male	Female	Total
Beria Madzonga resort (Zwigodini village)	Count	2	3	5
	%	40.0%	60.0%	100.0%
Big tree holiday accommodation (Madifha Zwigodini	Count	2	3	5
	%	40.0%	60.0%	100.0%
Big tree nature reserve (Zwigodini 'Madifha')	Count	3	2	5
	%	60.0%	40.0%	100.0%
LED and Tourism info center (Musina municipal offices)	Count	3	2	5
	%	60.0%	40.0%	100.0%
Manalani lodge (Tshipise village)	Count	1	4	5
	%	20.0%	80.0%	100.0%
Nwanedi nature reserve and resort (Gumela and Folovhodwe villages gates)	Count	2	3	5
	%	40.0%	60.0%	100.0%
Total	Count	13	17	30
	%	43.0%	57.0%	100.0%

Source(s): Interviews by the Author, 2019

underscore the essence of potential holistic alternative tourism in sustainable tourism and empowerment in Musina Municipality (Ramaano, 2021a). Analogously, Amir *et al.* (2015) presented the investigation program, plan, and opinions on responsible tourism. Henceforth, it is significant to involve ecotourism benefits and tourism development policy in conjunction with agritourism. To this end, Dondo *et al.* (2002) consider agriculture and tourism the fundamental foreign currency earners in Zimbabwe. However, amid predicaments in agriculture from irregular climate states and price instabilities in agricultural derivatives, tourism is now a reliable initiative and practice. They acknowledge the significance of infusing a more responsible strategy to enhance its operation. Analogously, Campbell and Ortiz (2011) and Zolfani *et al.* (2015) suppose that alternative tourism with ecotourism management can hoist tourism development in rural areas while being sensitive to climate change and rural livelihood issues. Hence, Siakwah (2020) established a similar thought that the sustainable tourism development standard is critical for handling and promoting tourism resources in Africa to attain sustainable development goals. Akin to this study, Keitumetse (2011) recommended the necessity for integrated ecotourism management for sustainable development achievements with the Botswana case study and Bunruamkaew and Murayam (2011) with specific reference to Thailand. To this end, Lyon *et al.* (2017) contend that the three sustainable tourism development pillars are indispensable for ecotourism schemes in South Africa. Admittedly, Binns and Nel (2002) have urged for sustainable ecotourism understanding to counterweight the local economic growth imperative; hence, tourism as a locally-based economic development approach in South Africa. Therefore, these grounds are harmonious with existing document reviews, the existing case study as exemplified by the general literature review, and standpoint data on the myriad roles of alternative and responsible tourism management systems in sustainable tourism, community empowerment, and sustainability.

3.3.2 Knowledge about the role of responsible tourism in combating environmental crises. Data in Table 5 exhibit that the majority of 16 interview respondents reacted negatively about their knowledge about responsible tourism and their part in combating environmental

Tourism ventures and entities		Interview Q.9 (b) Do you know the role of responsible tourism in combatting environmental crisis, such as *deforestation, environmental degradation and climate change?* No	Yes	Total
Beria Madzonga resort (Zwigodini village)	Count	3	2	5
	%	60.0%	40.0%	100.0%
Big tree holiday accommodation (Madifha Zwigodini	Count	2	3	5
	%	40.0%	60.0%	100.0%
Big tree nature reserve (Zwigodini 'Madifha')	Count	4	1	5
	%	80.0%	20.0%	100.0%
LED and Tourism info center (Musina municipal offices)	Count	1	4	5
	%	20.0%	80.0%	100.0%
Manalani lodge (Tshipise village)	Count	4	1	5
	%	80.0%	20.0%	100.0%
Nwanedi nature reserve and resort (Gumela and Folovhodwe villages gates)	Count	2	3	5
	%	40.0%	40.0%	100.0%
Total	Count	16	14	30
	%	53.3%	46.6%	100.0%

Source(s): Interviews by the Author, 2019

Table 5. Interview acknowledgments on the role of responsible tourism in combatting environmental crisis, such as *deforestation, environmental degradation and climate change*

crises such as deforestation, environmental degradation, and climate change. On the other hand, the minority pointed out positive knowledge about such awareness. Therefore, 46.6% of participants advocated such inquiry and expertise in responsible tourism and battling environmental degradation. Responsible tourism entails constructing better locations and more suitable establishments for people to visit and live in. Everyone must practice responsible behavior when engaging with the environment and ensure the sustainable use of tourism and environmental resources. It suffices to state that responsible tourism approaches are only endorsed to enhance sustainable tourism practices. Responsible tourism shares the same principles and goals as sustainable tourism in terms of social, economic, and environmental efficiencies. It mandates that hoteliers, governments, operators, local people, and tourists take accountability and take measures to drive tourism more sustainably (Goodwin and Francis, 2003). That being so, responsible tourism practices and ecotourism management can be a fitting mechanism for climate-conscious rural activities in the study area. With this in mind, hoisted agricultural land use management can join the fray and foster better yields and agritourism routes.

(1) Explication of the role of responsible tourism in combating environmental crises

Of the 46.6% who expressed some understanding of responsible tourism in combating environmental crises such as deforestation, environmental degradation, and climate change, they indicated that their scholar siblings divulged such facts to them. Consequently, they concede that responsible tourism proposes better optional resource utilization toward environmental management and sustainability. The municipality can accumulate from the utilization of this option. Henceforth, grow livelihoods through tourism, rural, and agricultural items. On the other hand, 40% of focus group discussions from the adjacent villages voiced positivity about the same probe with the local communities. Hence, 60% disapproved of some knowledge about responsible tourism and its positions on resolving environmental crisis issues and managing the environment. The aforementioned is comparable to Büscher and Davidov (2013), who assert that an augmented attitude toward ecotourism management indicates that sustainable tourism has a productive ability that fosters reframing and transforming certitude founded upon alternative bargains. Accordingly, they are influential in integrating breakdowns in sustainable significance, creative aptitude, and alternative tourism paradigms. Hence, responsible tourism can enable communities to generate sustainable utility as they encounter environmental and extension hurdles.

3.3.3 Data on knowledge about alternative tourism and its role in sustainability achievement. The data in Table 6 imply that a total of 11 interview respondents replied positively about alternative tourism in sustainability achievement and local resource administration. On the other hand, the majority of 19 respondents revealed no knowledge about such an inquiry. Therefore, 36.6% of participants attested to such awareness of alternative tourism in terms of sustainability, livelihoods, and local resource management in the study area. It is counteracted by 63.3% who voiced no familiarity with the same inquiry. A majority of three (60%) who expressed some positivity embedded themselves within the Manalani lodge and Tshipise village's responses. Thus, an articulation that the community has skimpy knowledge of alternative tourism, environmental management, sustainability, and livelihoods Alternative tourism is an inclusive phrase for all records of expeditions opposed to mass tourism; thus, remarkable awareness of economic, social, cultural, and environmental references Hence, it maintains an impartial and favorable effect on its destinations (Cohen, 1987; McGehee, 2002). To this effect, Acharya and Halpenny (2013) validate the role of alternative tourism in endorsing various sustainable tourism measures toward sustainability attainment in rural destination spots. Therefore, it is opposed to those in mass tourism entities that are not sustainable.

Tourism ventures and entities		Interview Q.9 (c) Do you know alternative tourism and its role in sustainability achievement? No	Yes	Total
Beria Madzonga resort (Zwigodini village)	Count	3	2	5
	%	60.0%	40.0%	100.0%
Big tree holiday accommodation (Madifha Zwigodini	Count	5	0	5
	%	100.0%	0.0%	100.0%
Big tree nature reserve (Zwigodini 'Madifha')	Count	3	2	5
	%	60.0%	40.0%	100.0%
LED and Tourism info center (Musina municipal offices)	Count	3	2	5
	%	60.0%	40.0%	100.0%
Manalani lodge (Tshipise village)	Count	2	3	5
	%	40.0%	60.0%	100.0%
Nwanedi nature reserve and resort (Gumela and Folovhodwe villages gates)	Count	3	2	5
	%	60.0%	40.0%	100.0%
Total	Count	19	11	30
	%	63.3%	36.6%	100.0%

Source(s): Interviews by the Author, 2019

Table 6. Interview acknowledgments on knowledge about alternative tourism and its role in sustainability achievement

(1) *Narratives on alternative tourism and its role in sustainability achievement*

With representation in acquaintance knowledge, it was evident from the entities' personnel interviews that alternative tourism and capacitating exemplars are not well-founded within the terminologies of the informants. As earlier cited, alternative tourism, akin to sustainable ecotourism, gives communities a track record of sustainable resource utilization. Hence, by providing diverse opportunities for community livelihoods, tourism, and commercial rural enterprises, people could benefit from these deeds. Therefore, 35.5% of focus group discussions regarding the similar questions on adjacent local communities were analogous to the interview on the acquaintance of knowledge response, while 65.0% thereof were rather pessimistic. In truth, it is precise that there is a shortage of sustainable tourism and its elementary role in society around the whole stretch. Therefore, it is important for a lobbying campaign to sensitize the community on the ideals of such tact in coexistence with sustainable tourism, livelihoods, and local resource management drives.

3.3.4 Any knowledge about the main contributing factors to environmental management and the local climate crisis. Data in Table 7 document that the minority participants, with a 3.3% indication, aired that the leading contributing factor is the cutting of riparian vegetation, for example, in orchard establishments and roof thatching materials activities. Henceforth, activities like trampling vegetation by vehicles and scratching and cutting trees by eco-tourists are more common and detrimental and were represented by 16.6%, along with over-cultivation of the local forest areas, e.g. land degradation. Therefore, 10.0% of excessive dumping of residues by tourists, such as empty cans, plastic, and others, was the third-lowest representation. The over-utilization of biomass and tree resources for fuel wood and the over-debarking of trees have a majority representation of 26.6%. Henceforth, indigenous medicine and other economic purposes were linked to 20.0% of replies. Consequently, only 6% of informants picked over-utilization of mountain vegetation and tree resources, like timber harvest.

(1) Narratives on the main contributing factors to environmental management and the local climate crisis

Table 7. Interview acknowledgments on the main contributing factors for environmental management and the local climate crisis in your area from the table below

Tourism ventures and entities		Interview Q.6.(c) What do you think is the main contributing factors for environmental management and the local climate crisis in your area from the table below?							
		Unsustainable eco-tourism activities, e.g. *trampling of vegetation by vehicles; scratching and cutting of trees by tourists*	Over-cultivation of the local forest areas, e.g. *land degradation*	Cutting of riparian vegetation, e.g. *for orchards and roof thatching materials*	Over-utilisation of biomass and tree resources, e.g. *for fuel woods*	Over-debarking of trees, e.g. *for indigenous medicine and other material purposes*	Over-utilization of mountain vegetation and tree resources, e.g. for timber harvest	Excessive dumping of residues by tourists, e.g. *empty cans, plastic and other pollutants*	Total
Beria Madzonga resort (Zwigodini village)	Count	0	2	0	1	1	1	0	5
	%	0.0%	40.0%	0.0%	20.0%	20.0%	20.0%	0.0%	100.0%
Big tree holiday accommodation (Madifha Zwigodini	Count	2	1	0	1	1	0	0	5
	%	40.0%	20.0%	0.0%	20.0%	20.0%	0.0%	0.0%	100.0%
Big tree nature reserve (Zwigodini 'Madifha')	Count	2	0	0	1	1	0	1	5
	%	40.0%	0.0%	0.0%	20.0%	20.0%	0.0%	20.0%	100.0%
LED and Tourism info center (Musina municipal offices)	Count	0	0	0	2	1	0	2	5
	%	0.0%	0.0%	0.0%	40.0%	20.0%	0.0%	40.0%	100.0%
Manalani lodge (Tshipise village)	Count	0	1	0	2	1	1	0	5
	%	0.0%	20.0%	0.0%	40.0%	20.0%	20.0%	0.0%	100.0%
Nwanedi nature reserve and resort (Gumela and Folovhodwe villages gates)	Count	1	1	1	1	1	0	0	5
	%	20.0%	20.0%	20.0%	20.0%	20.0%	0.0%	0.0%	100.0%
Total	Count	5	5	1	8	6	2	3	30
	%	16.6%	16.6%	3.3%	26.6%	20.0%	6.6%	10.0%	100%

Source(s): Interviews by the Author, 2019

The specified 16.6%, 20%, and 26% representations show that unsustainable eco-tourism activities and desperate livelihood efforts are the most advanced environmental crises that need urgent attention. To this end, environmental degradation and climate change-linked exercises necessitate significant reductions. The 6.6% who depict reduced exploitation of the mountainous resource manifest latent eco-tourism potential to incorporate with other tourism arrangements. Henceforth, heritage, green tourism, and geotourism practices within such vicinities and environs in the region are vital (Edgell Sr., 2016). The equally rationed 16.6% is the epitome of noticeable, diverse environmental effects necessitating enhanced natural resource management educational workshops for society. Yet, such measures need assets from provincial and local governments through specific movements, panels, and discussions. In passion, sustainable tourism can supplement eco-tourism and agricultural exercises while fortifying community tourism and sustainability in the environs. On a corresponding note, the focus group disclosed an interconnected view with equally conveyed replies of 15.0% for over-cultivation of the local forest areas and cutting of riparian vegetation, amongst four others of a similar reaction. To this account, a clear illustration of 20.0% defined the majority of answers for unsustainable eco-tourism activities like the trampling of vegetation by eco-tourists and local communities' vehicles. Such a specification is compatible with Theobald *et al.'s* (2005) contention that effective land use administration in less advanced countries got aggravated due to a blend of determinants, resulting in incompetence and turnover of decision-makers. Consequently, a deficiency of contact among authorities in operative scopes and scattered data are required by executives to construct genuine judgments. They thus appraise the role of knowledge-oriented rural development exercises in rural North American regions.

3.3.5 Awareness campaign about the role of responsible tourism and alternative tourism in local climate change and ecosystem service management strategies. Data in Table 8 show that four interview participants supported the awareness movement about the role of responsible and alternative tourism in local climate change and ecosystem services management schemes

Tourism ventures and entities		Interview Q.9 (e) Are there awareness campaigns on the role of responsible tourism and alternative tourism in local climate change and ecosystem services management strategy in your area? No	Yes	Total
Beria Madzonga resort (Zwigodini village)	Count	5	0	5
	%	100.0%	0.0%	100.0%
Big tree holiday accommodation (Madifha Zwigodini	Count	4	1	5
	%	80.0%	20.0%	100.0%
Big tree nature reserve (Zwigodini 'Madifha')	Count	5	0	5
	%	100.0%	0.0%	100.0%
LED and Tourism info center (Musina municipal offices)	Count	3	2	5
	%	60.0%	40.0%	100.0%
Manalani lodge (Tshipise village)	Count	4	1	5
	%	80.0%	20.0%	100.0%
Nwanedi nature reserve and resort (Gumela and Folovhodwe villages gates)	Count	5	0	5
	%	100.0%	0.0%	100.0%
Total	Count	26	4	30
	%	86.6%	13.3%	100.0%

Source(s): Interviews by the Author, 2019

Table 8. Interview acknowledgments on any awareness campaign about the role of responsible tourism and alternative tourism in local climate change and ecosystem services management strategy in your area

within their region. To this end, 26 respondents expressed some pessimism about such a probe. Overall, 13.3% of participants were supportive of any knowledge of such an appraisal campaign.

(1) Narratives about a campaign about the role of responsible tourism and alternative tourism in local climate change and ecosystem services management strategies

Undoubtedly, against the counteracting majority of 86.6% in the area, a small number (13.3%) advocated the existence of the aforesaid awareness campaign. However, it wasn't obvious what such endeavors entailed from the explanation. It is rather evident that there is a necessity for such a drive with the integrity of sustainable tourism principles, alternative tourism, and rural development initiatives within the study area. Likewise, the focus group discussion was confirmed by 15.0% of the campaign and 85.0% against such visions and other activities. To this account, some of the cited ambitions include all-around but futile sustainable tourism, environmental management education, and voluntary exercises by leading secondary and tertiary pupils from their respective localities.

4. Conclusions and implications

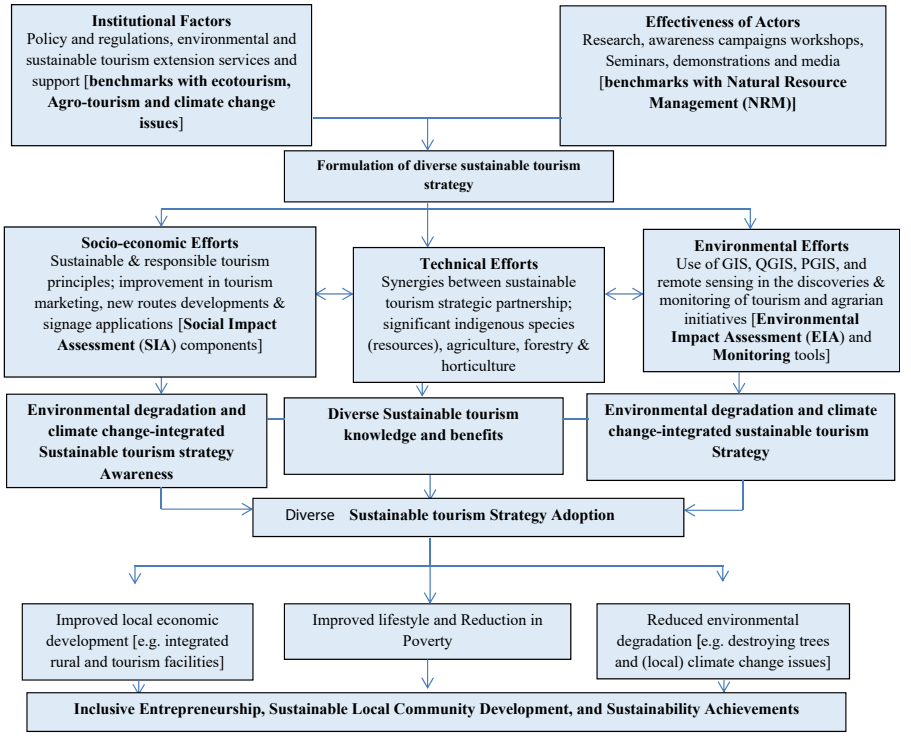
4.1 Key findings, academic, policy, economic, practical implications and limitations

4.1.1 Key findings and conclusion. Relevant knowledge was deficient in local communities, and proper application of responsible tourism and ecotourism management workshops by conservation and tourism entity personnel and related stakeholders was similarly inadequate. Consequently, there were fewer strides for environmental management strategies to mitigate climate change, and there is a dual relationship between ecotourism practices, environmental degradation, and climate change. Holistic ecotourism practices combat environmental consequences, while dismal practices contribute to the ecological crisis and climate change-linked outcomes, as they do with agricultural activities. Sustainable agricultural activities elevate the chance for optimistic agritourism enterprises. As such, the maximum opportunities to battle climate change via supplemental funds are achievable. However, it suffices to say that unsustainable agriculture worsens conditions for environmental transformations and their negative consequences. It corresponds with this study's findings, whereby irresponsible ecotourist behavior within the Big Tree Nature Reserve and surrounding areas gave glimpses of environmental degradation and land pollution fueling climate change plights. Unsustainable agricultural activities, such as over-cultivation and clearing of riparian vegetation, were found to be common in the study area. Ultimately, it was elaborated that sustainable ecotourism can allow the best management of local biodiversity resources and that responsible tourism and alternative tourism layouts can reinforce such activities. Simply put, sustainable tourism and integrated rural development endeavors can administer better ecotourism and agrarian management platforms in remote areas, thus providing a panacea to environmental degradation and climate change's consequences. Given this, the mutual synergy between ecotourism, responsible tourism, and agriculture in community development is a feasible alternative form of livelihood within the study area.

4.1.2 Academic implications. Indeed, alongside the theoretical implications, narrative literature, and pertinent papers reviewed, varied situations in responsible tourism, ecotourism, and diverse alternative tourism tactics allowed enterprises and transactions in farming and tourism. However, akin to this study's estimate, Thomas (2008) has posited the decisive role of well-articulated land use management and ecotourism administration in combating environmental degradation and climate change issues while improving the livelihoods of the locals. While dismally planned ecotourism can result in degradation and climate change dilemmas, its genuine planning and sustainable tourism rationale are dependable mechanisms for defending and managing local and provincial biodiversity (Das and Chatterjee, 2015). Camilleri (2016) asserted the weight of responsible tourism in

tourism development, leadership, commerce, and sustainability, liaising with environmental plans. To this account, the prevailing interviews and focus groups within the study area exemplified a lack of knowledge about responsible tourism and alternative tourism plans in rural resource management. Henceforth, it was about overall limited holistic in rural development and livelihoods. Accordingly, Figure 3 is docked on the all-inclusive suggestions of this case study and its emphasis on sustainable tourism and ecotourism efficiencies. It shows that aspects like policy and rules affecting the effectiveness of role players such as researchers and the media can bolster tourism and community improvement in rural environments. Furthermore, it is akin to the privileges of community-based natural resource management (CBNRM), agro-tourism, and sustainability agendas.

4.1.3 Policy and practical implications. There is an assertive call for a participatory tourism-oriented strategy for rural forest and agrarian resources in Musina Municipality to grant inclusive socio-economic expansion. Indeed, national, regional, and local government entities have a responsibility to concentrate on the vital intent of combating environmental degradation and climate change, cognizant of tourism resources and ecotourism management systems (Ampaire *et al.*, 2017). Henceforward, it is critical to advanced livelihood via the intensification of distinctive initiative agendas. With that, it is known that collaborative forestland tenure reform approaches are integral (Xie *et al.*, 2014). Thus, it is also for a persuasive tourist development strategy, as well as integrated rural livelihoods of forestry and agricultural resources and their tenures, in South African content and within the study area. The principles of GIS, participatory geographic information systems (PGIS),



Source(s): Authors' own

Figure 3.
The envisaged sustainable tourism and environmental degradation and climate change-conscious sustainability model for the municipality and rural communities

remote sensing (RS), and other information and communication (ICT) technologies, tools, and approaches, along with CBNRM, community-based tourism (CBT), and community-based organizations (CBO), can all catalyze efforts in enterprise management partnerships. The cited practices can be practiced in conjunction with the locals' indigenous knowledge (IK) to address climate change quandaries, enhance agrarian livelihoods, and manage biodiversity. Accordingly, Figure 4 illustrates a model for integrated tourism policy envisioned for synergistic alternative ecotourism and agritourism-integrated rural livelihoods within the context of rural activities impacted by environmental decline and climate change. A tourism policy's plan should capitalize on any resulting socioeconomic, technological, and environmental goals. Similarly, experimenting with new methods, working with sustainable tourism strategic alliances, and prioritizing various GIS like PGIS and RS in locating and monitoring the tourism sector could all be crucial sustainability decisions. From now on, similar timetables will apply to other fields, like web-integrated tourism technology, a variety of community-empowering information systems, business, and management (Ramaano, 2022a, b, c, d, e; Guo and Shi, 2022; Putra *et al.*, 2022). To this effect, Zou *et al.* (2022) hinted at the essence of forest assignment security on the forestry management efficiency of farmers for diverse forest management undertakings.

4.1.4 Economic implications. An intermixed tourism plan would emphasize advanced ecotourism management and comprehensive community empowerment in rural regions and the farming communities dwelling adjacent to conservancy sites. Thus, it is crucial to sustain an adequate tourism policy that includes efforts to process local supplies, alternative tourism approaches, equality, and sustainability (Tohani, 2022). For example, bioprospecting efforts, agricultural extension, responsible tourism education, and CBNRM, CBT, and agritourism partnerships with local hospitality entities within the conservancy areas can ensure that local communities are beneficiating resource usage within adjacent protected areas in regulated ways, which would prevent unregulated and overused biodiversity within the protected and surrounding areas. Henceforth, promote sustainable forestry and environmental conservation, prevent poaching and overcutting of trees and overharvesting of forest

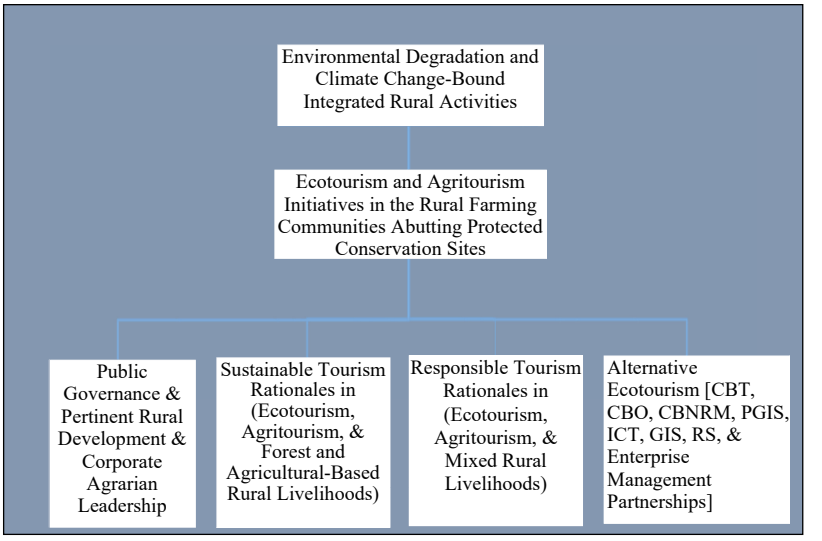


Figure 4.
Model for potential and synergetic alternative ecotourism amid the environmental degradation and climate change-bound rural activities for the locals' livelihoods

Source(s): Authors' own compilation; adapted from Ramaano (2022d)

commodities, environmental degradation, and climate change consequences, and support socioeconomic needs and livelihoods in a sustainable and endorsing effort to limit excessive GHG emissions. To this end, bioprospecting entails investigating the molecular, species, and genetic levels of diversity to realize and commercialize new by-products that are of economic importance (Rathore and Shashni, 2023). This is backed and accentuated by existing document reviews on rural activities, environmental degradation, tourism corporations, ecotourism administration, and subsistence in Musina Municipality. According to this account, climate change is linked to environmental degradation associated with unsustainable ecotourism and agricultural activities. Therefore, there is a potential influence on meager livelihoods and compromised environmental management and sustainability ideals (Ramaano, 2022b, c). A sustainable tourism plan is close to the participants' perceptions, benefits, and attitudes, particularly in local communities. Accordingly, how the citizens regard sustainable tourism as an accepted technique could stimulate local economic products, subjugate poverty, and mitigate environmental degradation and climate change consequences. Certainly, tourism-based actions could expand livelihoods and sustainability necessities. Thus, any traditional tourism policy within the rural environs should not strand the cooperation between agriculture and rural tourism projects, with the help of responsible tourism ideals. Moore (2019) opined that participatory efforts for sustainable tourism have crucially renovated technological and social methods of ecotourism and decision planning in environmental management. Admittedly, a potential extensive tourism policy strategy to develop subsistence is needed (Naserianasl *et al.*, 2021; Kumar *et al.*, 2022). Eventually, achieving rural initiatives and tourism development tactics could prove fundamental for Musina Municipality's biodiversity management and spur livelihoods.

4.1.5 Limitations and further study implications. This examination utilizes the Musina Municipality example as a lens to exhibit the intrinsic aspect of alternative tourism in ecotourism management and rural exercises for community livelihoods. However, it was constrained by a smaller sample, only cross-tabulation analysis, and solely literature reviews, interviews, and focus group discussions, except for field observation. Similarly, it only utilized old maps as corroborating data against more recent captions. Thus, additional analysis may use content analysis themes around the same essences (Ramaano, 2022a, b, g). Dynamic geographic information systems and remote sensing can additionally be utilized for further research due to the aerial setting and propagation of the study area. Furthermore, to counteract the effect of smaller subsample usage, future investigations can use a large stratified sample equivalent to the main sample of the original study with enhanced demographic data to reduce generalization and improve their impact. Within the cited areas, candidates have opportunities to use sophisticated analysis software along the lines of big data analytics for tourism, conservation, pastoral enterprises, and subsistence in the environs. The livelihood framework of Bennett *et al.* (2012) can thus play a pivotal role in achieving the cited endeavors. Notwithstanding all the limitations cited in this examination, possibly a more valuable method of enlisting sustainable tourism and sustainability in rural vicinities could be inside a decent ecotourism, alternative tourism, and rural development strategy. Hence, it is essential to integrate participatory ecotourism planning and responsible tourism among practitioners and local communities (Alam *et al.*, 2022). Similar to this reflection, Ankomah and Larson's (2000) appraisal that responsible tourism is critical for sustaining and developing tourism in sub-Saharan Africa. The cited studies could support the present and potential tourism purposes within the respective tourism policies, IRDAs, and ecotourism-based public leadership (Bramwell and Sharman, 1999; Ramaano, 2022c, d; Poon, 2023). Hence, there is also space for the utilization and adequate endowment of agritourism and livelihood activities. Subsequently, such is the inference of this case study. The next part presents references.

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