

Empowering local communities for sustainable tourism and resource conservation: A case study of Golija Studenica Biosphere Reserve

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Abstract

This study investigates the role of community empowerment in promoting sustainable tourism development and resource conservation within the Golija Studenica Biosphere Reserve, a site renowned for its unique biodiversity and socio-economic challenges. Drawing on survey data from 361 respondents, the research examines pathways through which empowerment fosters sustainable tourism practices, increased tourism involvement, community-led initiatives, and resource conservation. A structured resident survey was analysed with structural-equation modelling (SEM) to trace the causal pathways from empowerment to behavioural outcomes. Two key results stand out: (i) psychological and economic empowerment jointly explain more than half of the variance in residents' willingness to engage in sustainable tourism; (ii) political empowerment, in contrast, exerts a small but significant negative effect on conservation support, pointing to governance frictions. The findings highlight the critical role of local communities in preserving biodiversity and advancing socio-economic development in biosphere reserves. Key implications are provided for policymakers, conservationists, and stakeholders to support empowerment strategies that enhance sustainable tourism and conservation outcomes.

Keywords: community empowerment; tourism involvement; sustainable tourism; support for tourism; willingness to conserve resources.

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1. Introduction

The fundamental basis of society is made up of local communities, which are made up of people who reside in a certain area and share resources, values, and cultural practices (Tanrikul, 2023). They are essential for maintaining social cohesiveness, conserving the environment, and boosting the economy (Agrawal & Gibson, 1999). Consequently, empowering residents is a prerequisite for equitable, sustainable development (Stanard *et al.*, 2021), a point underscored by recent calls for organised community action (Hofer *et al.*, 2024; Iqbal *et al.*, 2023).

Community empowerment is the process by which people gain control over decisions and resources that shape their lives (Kruahong *et al.*, 2023). It can involve capacity-building, education, access to finance, and participatory governance (Steiner *et al.*, 2023), and it raises communities' ability to champion sustainability, conserve resources, and improve quality of life (Wani *et al.*, 2024). Empowered communities are more innovative, resilient, and capable of tackling complex challenges such as climate change, inequality, and environmental degradation (Khalid *et al.*, 2019). By 2030, the SDGs aim to eradicate poverty, protect the environment, and ensure peace and prosperity for all (UN, 2024). Achieving the Sustainable Development Goals (SDGs) hinges on active local participation, especially where tourism fuels growth yet strains ecosystems. UNESCO biosphere reserves illustrate this dilemma: mandated to balance biodiversity and development, they show that when residents co-design tourism plans, conservation support and eco-friendly livelihoods rise simultaneously (UNESCO, 2024; Petriello *et al.*, 2024; Koricha & Jemal Adem, 2024). Local participation is the linchpin of sustainable tourism: it transforms visitor spending into durable economic gains and safeguards local ecology and culture (Sharma & Bhat 2023). Cultural-heritage initiatives exemplify this dynamic—when heritage sites are developed through community-based planning, they both lift household incomes and deepen residents' commitment to conservation (Wani *et al.* 2025a; Han *et al.* 2023).

Balancing development with environmental protection is inherently contested. Growth-led projects—especially large-scale infrastructure—often degrade ecosystems and undercut sustainability goals (Schelhas & Lassoie 2001). Long-term viability therefore depends on shifting from “growth first” to “safeguards first,” embedding ecological limits directly inside development plans. When such plans protect ecosystem services essential to human well-being and economic activity, they also secure cultural and natural assets for future generations (Summers *et al.* 2018; Arpin 2019). The Golija Studenica Biosphere Reserve (GSBR), located in a geographically and ecologically sensitive region, presents a unique opportunity for sustainable tourism development and resource conservation. The GSBR is notable for its rich biodiversity, cultural heritage, and environmental pressures, such as deforestation and resource over-exploitation. The GSBR is a highly valuable case study for understanding community empowerment in the context of biosphere reserves, sustainable tourism, and conservation efforts. Despite valuable work on tourism-related empowerment (Gautam & Bhalla, 2024; Khalid *et al.*, 2019; Mayaka *et al.*, 2020; Wani *et al.*, 2024; Wani *et al.*, 2025b), no study has simultaneously modelled the full spectrum of empowerment—psychological, social, political, economic, and environmental—within a biosphere-reserve context.

Methodologically, isolating only one- or two-dimensions risks omitted-variable bias in structural-equation models, because the dimensions are inter-dependent (e.g., economic gains may be meaningless without political voice). Practically, managers need to know which dimension—or combination—most strongly drives residents' willingness to conserve resources and support sustainable tourism.

To address this, our SEM integrates all five dimensions and tests their direct and mediated effects on (i) tourism involvement, (ii) tourism support, (iii) willingness to conserve, (iv) sustainable-tourism development, and (v) quality of life in the Golija–Studenica Biosphere Reserve (GSBR). The primary

aim is to assess how community empowerment affects conservation and sustainable tourism support in the GSBR.

By integrating all five empowerment dimensions, this study presents a holistic understanding of how community empowerment can influence local participation in sustainable development initiatives. The inclusion of these dimensions provides a more nuanced view of the factors that enable or hinder effective community engagement with conservation and tourism practices. Furthermore, this research contributes to the existing literature by emphasizing the role of biosphere reserves, which have been largely overlooked in prior studies. Understanding the dynamics of community empowerment within the GSBR offers valuable insights into promoting sustainable tourism and enhancing environmental conservation efforts. This paper contributes by addressing a critical gap in the literature, emphasizing the importance of empowerment for sustainable tourism development and resource conservation in biosphere reserves.

2. Theoretical background and hypotheses development

2.1. Coexistence of biosphere reserves and sustainable tourism (ST)

Recognized areas under UNESCO's MAB (Man and the Biosphere Program) are biosphere reserves (BRs) (UNESCO, 2024). By combining sustainable development, research, and teaching with biodiversity conservation, BR seek to advance a harmonious coexistence of humans and the environment (Bridgewater, 2002). ST and BRs show how these goals—preserving the environment and encouraging ethical travel—coexist (Botha, 2023). Ecotourism may help local economies thrive within BRs, promote conservation efforts, and inform tourists about the value of sustainable practices and biodiversity (Vitálišová & Vavrušová, 2023). BRs can offer tourists worthwhile experiences while guaranteeing the preservation and sustainability of cultural and natural resources for upcoming generations by using sustainable methods (Negev *et al.*, 2019).

2.2. Local community empowerment

A key component of accomplishing sustainable development (Wani *et al.*, 2024) and conservation (Petriello *et al.*, 2024) objectives in BRs is empowering local community. BRs have the potential to promote a harmonious relationship between humans and nature by allowing communities to participate in decision-making, developing their capacities, generating economic possibilities, and honoring their cultural legacy (Yang, 2024). In addition to improving the wellbeing of the surrounding populations, this empowerment helps ensure the long-term viability and prosperity of biosphere reserves (Scheyvens & van der Watt, 2019). Communities that are empowered feel more in charge of and in control of the tourism-related activities that take place in their area (Mayaka *et al.*, 2020). Over the past decade, various forms of empowerment have been studied. Boley *et al.* (2014) identified social, political, economic, and psychological empowerment, while Scheyvens & van der Watt (2021) introduced a framework with six dimensions, adding environmental and cultural empowerment.

When empowered through education, training, and resource availability, local communities are more likely to engage in tourism-related activities and support tourism projects that align with their values and interests (Gautam & Bhalla, 2024). Empowered communities endorse sustainable tourism, as they see it aligning with their goals and cultural heritage (Han *et al.*, 2024).

Empowerment is a multidimensional concept crucial for understanding community engagement in sustainable tourism. In this study, five key dimensions are considered based on the literature (Boley *et al.*, 2014; Gautam & Bhalla, 2024; Scheyvens & van der Watt, 2021; Zimmerman, 1995):

- Psychological empowerment refers to a sense of self-efficacy and confidence in influencing decisions within the community.

- Social empowerment involves the strengthening of social ties and collective identity that support local initiatives.
- Political empowerment highlights the community's ability to participate in decision-making and influence tourism policy.
- Economic empowerment relates to access to and control over financial resources and tourism-related opportunities.
- Environmental empowerment reflects the community's role in conserving and managing natural resources sustainably.

These five dimensions form the theoretical foundation for the hypotheses developed in this study.

The following hypotheses, grounded in the empowerment framework, are proposed:

H1: Empowerment Dimensions and Community Involvement in Sustainable Tourism

- *H1a: Psychological empowerment positively influences community involvement in sustainable tourism development.*
- *H1b: Social empowerment positively influences community involvement in sustainable tourism development.*
- *H1c: Political empowerment positively influences community involvement in sustainable tourism development.*
- *H1d: Economic empowerment positively influences community involvement in sustainable tourism development.*
- *H1e: Environmental empowerment positively influences community involvement in sustainable tourism development.*

H2: Empowerment and Support for Sustainable Tourism Development

- *H2a: Psychological empowerment positively influences support for sustainable tourism development.*
- *H2b: Social empowerment positively influences support for sustainable tourism development.*
- *H2c: Political empowerment positively influences support for sustainable tourism development.*
- *H2d: Economic empowerment positively influences support for sustainable tourism development.*
- *H2e: Environmental empowerment positively influences support for sustainable tourism development.*

H3: Empowerment and Support for Resource Conservation

- *H3a: Psychological empowerment positively influences support for resource conservation.*
- *H3b: Social empowerment positively influences support for resource conservation.*
- *H3c: Political empowerment positively influences support for resource conservation.*
- *H3d: Economic empowerment positively influences support for resource conservation.*
- *H3e: Environmental empowerment positively influences support for resource conservation.*

A key factor in encouraging a willingness to participate in resource conservation is local community empowerment (Ahmadpour Borazjani *et al.*, 2017). Communities given more authority are more inclined to lead conservation initiatives and see that their natural environment is maintained throughout time (Petriello *et al.*, 2024). Numerous strategies, such as inclusive decision-making, capacity building, financial incentives, and respect for local knowledge and culture, can empower communities (Constantino *et al.*, 2012; Malta, 2023; Steiner *et al.*, 2023). Encouraging tourism that recognizes and appreciates regional culture and environment boosts the local economy and fosters cultural pride, which inspires people to protect the environment (Scheyvens, 1999). Because they perceive observable benefits and have a feeling of control over their resources, empowered communities are more inclined to engage in conservation activities (Agrawal & Gibson, 1999). Community pride and identity are fostered by participation in conservation efforts (Wang *et al.*, 2023). Since local knowledge and practices are utilized, community-driven projects frequently produce conservation outcomes that

are more successful and sustainable (Oladeji *et al.*, 2022). Community social ties are reinforced by joint conservation efforts, which promote cooperation and support among members (Agrawal & Gibson, 1999). Communities with more power are more capable of managing resources sustainably, striking a balance among the demands of economic development and conservation (Petriello *et al.*, 2024). Therefore, enhancing the willingness of local communities to take part in conservation activities requires first empowering them.

H4: *Local community members who feel empowered in the following dimensions are more likely to participate in the conservation of cultural and natural resources:*

- *H4a: Psychological empowerment will positively influence local community participation in the conservation of cultural and natural resources.*
- *H4b: Social empowerment will positively influence local community participation in the conservation of cultural and natural resources.*
- *H4c: Political empowerment will positively influence local community participation in the conservation of cultural and natural resources.*
- *H4d: Economic empowerment will positively influence local community participation in the conservation of cultural and natural resources.*
- *H4e: Environmental empowerment will positively influence local community participation in the conservation of cultural and natural resources.*

2.3. *Proactive Role in Sustainable Tourism Development (PRSTD)*

To limit negative effects on the environment and local cultures while generating economic advantages and advancing social fairness, a proactive role in sustainable tourism development (PRSTD) is a critical approach to tourism development (Zolfani *et al.*, 2015). Adopting a proactive role in PRSTD can significantly enhance the quality of life for local residents through its economic, social, and environmental contributions (e.g., Lordkipanidze *et al.*, 2005; Vogt *et al.*, 2020). This involvement can create employment opportunities, promote local entrepreneurship, and support community development, improving local living standards and sustainability. Employment in sectors like hospitality, retail, and transportation arises from such initiatives, providing locals with stable sources of income (Manzoor *et al.*, 2019). Furthermore, local entrepreneurs can establish tourism-related businesses such as restaurants, guesthouses, and tour services to foster local economic growth (Lordkipanidze *et al.*, 2005).

When tourism-related investments are made, the community benefits through the improvement of infrastructure, including roads, utilities, and public transport (Abbas *et al.*, 2024). Reinvesting from sustainable tourism can contribute to preserving natural areas and biodiversity (Samal & Dash, 2023). Tourism can also provide the financial resources needed for the restoration and maintenance of cultural heritage monuments (Cai *et al.*, 2021). Cultural traditions at risk of disappearing can be revitalized through sustainable tourism, which encourages interest in traditional crafts, music, dance, and cuisine (Stanikzai *et al.*, 2024). By prioritizing the welfare of local communities and promoting responsible tourism practices, a proactive role in sustainable tourism can have a positive and lasting impact on both residents and the destinations they inhabit (Vogt *et al.*, 2020). Given the significant influence of a proactive role in sustainable tourism on residents' quality of life, the following hypothesis is proposed:

H5: *A proactive role in sustainable tourism development positively contributes to the improvement of residents' quality of life.*

Local communities' willingness to protect their cultural and natural resources can be greatly impacted by ST (Baloch *et al.*, 2022). ST builds a strong foundation for local communities to take part in and commit to preservation efforts by offering financial incentives, encouraging community involvement,

boosting cultural pride, increasing environmental awareness, and sponsoring conservation projects (Fong & Lo, 2015; Krittayaruangroj *et al.*, 2023). Communities are more inclined to actively take part in preserving their environment and legacy for future generations when they perceive observable benefits from ST (Scheyvens, 1999). Therefore, the following has been suggested:

H6: *A proactive role in sustainable tourism development increases local communities' willingness to conserve cultural and natural resources.*

2.4. Tourism participation and support for tourism development

The degree of local community members' involvement and engagement in tourist-related activities is referred to as tourism participation (Reindrawati, 2023). The involvement of residents is a crucial factor that influences residents' support for tourist development (Gautam & Bhalla, 2024). As stated by Han *et al.* (2023), the absence of cooperation, support, goodwill, and engagement from the local community will hinder the effectiveness of ST development operations. The effectiveness and longevity of tourist programs depend heavily on the support of the local population (Pezeshki *et al.*, 2023). Communities are more prone to support tourist initiatives for development when they actively take part in tourism management and planning (Han *et al.*, 2023). However, it is equally important to recognize the role of local communities in conservation efforts and their dual involvement in both tourism and conservation processes. In many rural and protected areas, residents are not only key players in tourism development but also in conservation initiatives. Their deep connection with the local environment and traditional knowledge makes them critical contributors to the sustainable management of natural and cultural resources. However, challenges such as lack of training, insufficient financial incentives, and conflicting interests between development and conservation goals often hinder their effective participation. Understanding these barriers is crucial for fostering greater local involvement in both tourism and conservation, which will ultimately support the long-term sustainability of the destination. Accordingly, the following hypothesis has been proposed:

H7: *Local community's tourism involvement increases local communities' support for tourism development.*

A thorough approach to tourist development includes interconnected elements such as quality of life, ST, local community empowerment, and tourism involvement. Developing tourism destinations that benefit locals and tourists alike while protecting the cultural legacy and the environment for future generations requires empowering communities, encouraging active engagement, and supporting sustainable practices. In summary, the model (Figure 1) shows how the various elements of sustainable tourism development's framework —such as local community empowerment, tourism participation and support, ST, and willingness to conserve natural and cultural resources—are interrelated and reinforce one another.

3. Case Study Area

In Serbia, there are three sites included as biosphere reserves on the UNESCO MaB list: Golija-Studenica (2001), Bačko Podunavlje (2017) and Mura-Drava-Danube transboundary biosphere reserve (2021) (UNESCO, 2024).

GSBR is situated in the southwest of Serbia, where it encompasses the massif of Golija mountain (1833 m) and covers the area of 53,804 ha (Figure 2). Golija is covered with thick forests, some of which have characteristics of the primal forest. Meadows and grazing fields cover the southern slopes, while thick spruce woods encircling peatlands are recognized for their unique natural value. More than 900 plant species have been identified, including relict and endemic species of special ecological significance (UNESCO, 2024; Stojanović *et al.*, 2022). These rich ecological resources are closely tied to

environmental empowerment, as they offer opportunities for local stewardship and conservation-based tourism.

The mountain Golija is protected as a Nature Park under the national Law on Nature Protection (2021) to preserve valuable forest ecosystems, diverse landscapes, and cultural heritage. The Studenica Monastery, a UNESCO World Heritage Site, further enhances the cultural and spiritual value of the region (UNESCO, 2024; Stojanović *et al.*, 2022). This heritage fosters psychological empowerment by enhancing residents' sense of pride, identity, and attachment to place.

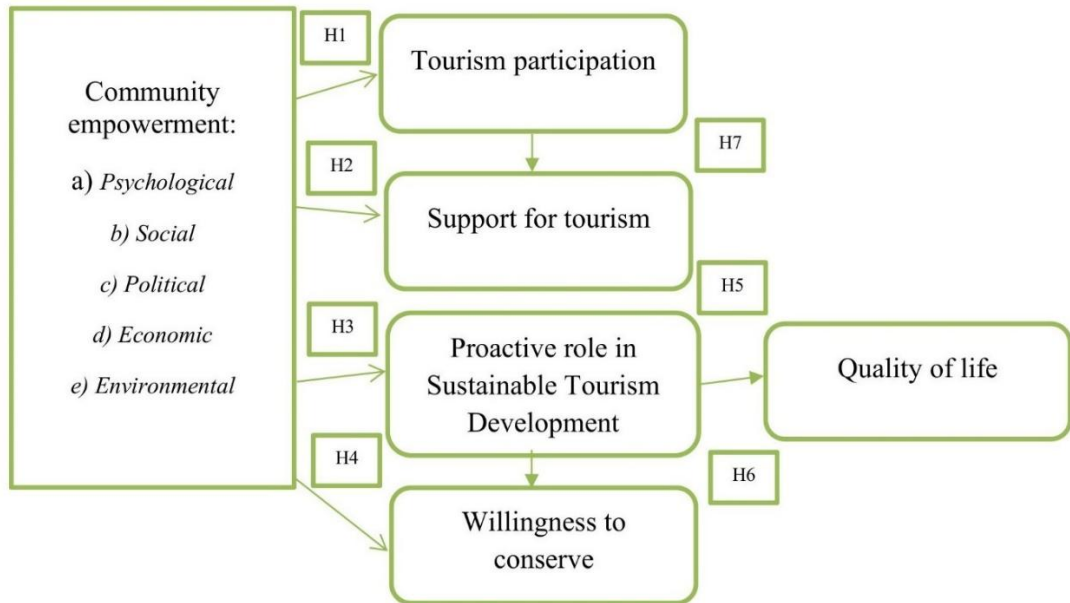


Figure 1. *Proposed Research Model and Hypotheses*

However, tourism development in the region faces potential challenges. Unmanaged growth in tourism activities may put pressure on fragile ecosystems and biodiversity, threatening the sustainability of traditional landscapes and lifestyles. Sustainable tourism practices and careful planning are necessary to ensure tourism does not harm the environment while still benefiting local communities.

GSBR offers an ideal setting to examine how different empowerment dimensions—psychological, social, political, economic, and environmental—interact with tourism development and conservation efforts. For example, local engagement in cultural heritage preservation supports psychological empowerment, while managing protected forests and biodiversity links to environmental empowerment.

Traditional settlements on Golija mountain, such as hamlets and scattered households, are found up to an elevation of 1300 m. A lifestyle based on agriculture evolved, creating a landscape of pastures, meadows, and forests (Pantić *et al.*, 2021). GSBR is home to 6600 residents within 42 dispersed rural communities. These spatially dispersed settlements reflect a strong social structure, contributing to social and political empowerment through locally organized land use and shared decision-making.

Additionally, the traditional livelihoods, such as cattle farming and collection of wood forest products, demonstrate the deep connection between the local community and the environment, aligning with the hypothesis that community empowerment may influence the willingness to participate in

conservation activities and support sustainable tourism development. The economic empowerment dimension is reflected in the growing local entrepreneurship in tourism and nature-based industries. The production of plant-based products and culinary specialties supports economic resilience and encourages active participation in tourism markets (Luković *et al.*, 2021).

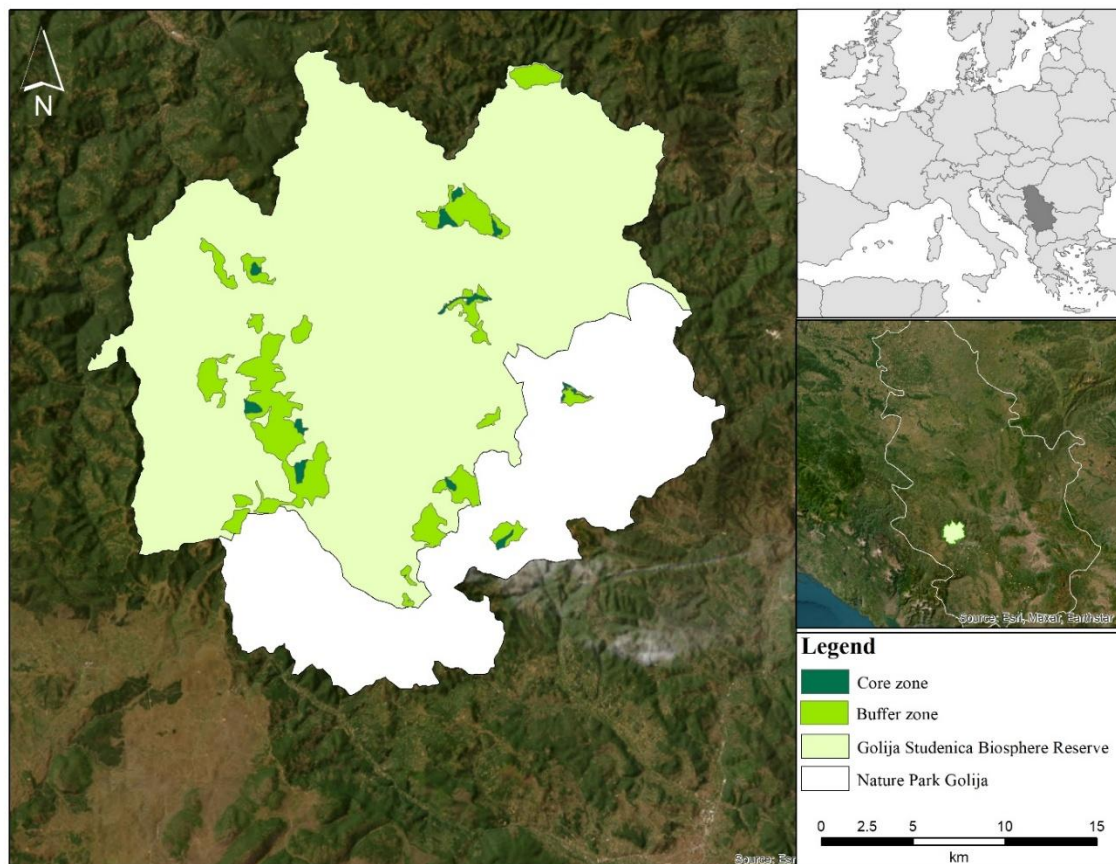


Figure 2. A location map of the study area (GSBR)

Source: Map created by dr Vladimir Marković

Golija Mountain is classified as an area of special natural and cultural value, where the quality of the landscape and the physical structure of settlements are of outstanding importance for tourism development (Milićević *et al.*, 2021). The GSBR encompasses most of the Golija Nature Park, which is managed by the Public Enterprise "Srbijašume". In recent years, the area has gained recognition as a nature-based tourism destination offering a wide range of ecosystem services. Nature-based activities (e.g., hiking, wildlife viewing, and local gastronomy) foster both psychological and environmental empowerment by enabling residents to feel connected to their environment while gaining from its responsible use.

4. Data and methods

A set of questions was used to create a survey to gain additional knowledge about the attitudes of GSBR residents regarding ST and their willingness to participate in conservation.

4.1. Study sample

This study targeted residents from the 39 communities within the Golija Studenica Biosphere Reserve (GSBR). Using a quota-purposive sampling approach, participants were selected to ensure balanced representation across municipalities, demographics, and settlements. The most recent census results from 2022 (Census, 2022) show that there are 5759 people living along the GSBR's border in the municipalities of Ivanjica (16 settlements, 1958 inhabitants), Kraljevo (12 settlements, 2800 inhabitants), Raška (five settlements, 401 inhabitants), Novi Pazar (five settlements, 542 inhabitants), and Sjenica (one settlement, 58 inhabitants). Nevertheless, compared to the 2011 Census (Census, 2011), the population of all these municipalities decreased, apart from Novi Pazar.

Quota-purposive sampling was chosen over random methods due to the dispersed population and challenging terrain, which made probability sampling impractical. This method allowed deliberate inclusion of subgroups across locations, age, gender, and occupations, ensuring diverse and contextually relevant insights. Based on Cochran's formula (Cochran, 1977), a sample size of 361 was calculated to achieve a 95% confidence level and a margin of error of 4.89%. While this non-probability technique limits statistical generalizability, it provides valuable exploratory insights into community perceptions and relationships within the GSBR.

While this non-probability sampling technique enhances contextual relevance and enables focused insight into local perspectives, its limitations in terms of generalizability must be acknowledged. The findings are not statistically generalizable to the entire population but are valuable for exploring patterns, perceptions, and relationships relevant to the study's objectives within the GSBR context. The margin of error was deemed acceptable given the population size, terrain complexity, and the exploratory nature of the study.

4.2. Procedure

The questionnaire was translated into Serbian and back-translated to English to ensure accuracy. After pilot testing with a small group to confirm clarity, the final survey was distributed via Google Forms between April and August 2024 through Facebook and Instagram groups relevant to the target municipalities.

Participants received detailed information about the study's purpose, confidentiality, voluntary participation, and data use strictly for research. Ethical standards, including anonymity and informed consent, were strictly maintained throughout data collection.

4.3. Instrument

The survey was divided into seven parts. The first contained some respondent's sociodemographic details (gender, age, education, employment status, type of job, household size and length of residency). The questions in sections 2-7 were adapted and modified from previous studies (Table 1). These adapted sections have been previously validated in similar contexts, ensuring their relevance and reliability in assessing the dimensions of community empowerment, tourism involvement, and related constructs.

The second section assessed community empowerment and included different dimensions of empowerment like psychological (PE), social (SE), political (PTE), economic (ECE), and environmental (ENVE). The third section of the questionnaire investigated tourism involvement (TI), followed by proactive role in sustainable tourism development (PRSTD) in fourth section. The fifth section assessed support for tourism development (SUPP) and the sixth section asked about quality of life (QOL). The last section assessed the willingness toward resources conservation (WC).

The respondents were tasked with deciding the degree of agreement with the statements in sections two through six on a Likert scale (5 point - 1 being strongly disagreed with and 5 being strongly agreed).

Table 1. *Questionnaire used in study*

Questionnaire section		Dimension	Research
Section 2	Community Empowerment (CE)	Psychological empowerment (PE) (five items)	Boley & McGehee, 2014
		Social empowerment (SE) (three items)	
		Political empowerment (PTE) (four items)	
		Economic empowerment (EE) (three items)	Scheyvens 1999; Abou-Shouk <i>et al.</i> , 2021
		Environmental empowerment (ENVE) (four items)	Scheyvens & van der Watt, 2021
Section 3	Tourism Involvement (TI)	three items	Suhartanto <i>et al.</i> , 2018
Section 4	Proactive role in Sustainable Tourism Development (PRSTD)	six items	Nicholas <i>et al.</i> , 2009
Section 5	Support for Tourism Development (SUPP)	four items	Strzelecka <i>et al.</i> , 2017
Section 6	Quality of Life (QOL)	five items	Budhiasa <i>et al.</i> , 2015; Uysal <i>et al.</i> , 2012
Section 7	Willingness toward resources conservation (WC)	four items	Oladeji <i>et al.</i> , 2022

4.4. Statistical methods

After the surveys were gathered, the data were analyzed in IBM Software SPSS. The questionnaire's validity was evaluated by Pearson's correlation (two-tailed significance level 5%). To assess the suitability of the data for factor analysis, two diagnostic tests were employed: the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity. The KMO test was chosen because it measures sampling adequacy, indicating whether the variables in the dataset are likely to factor well. The KMO was 0.803, higher than the generally advised value of 0.6 needed for a good factor analysis, values above 0.8 are considered meritorious (Kaiser, 1974).

Additionally, the results of Bartlett's test of sphericity demonstrated the data's reliability with a significant result ($\chi^2 (820) = 22193.788, p = 0.000$). This test was included because it evaluates whether the correlation matrix significantly differs from an identity matrix, confirming that relationships exist between variables and supporting the factorability of the data.

Then a common method bias (CMB) check was carried out and it was determined that a single element's overall variance of 34.14% leads one to conclude that CMB did not affect the data (single element less than 50% - Spector & Brannick, 2009). To determine the point of deviation from the normalcy of the data, kurtosis and skewness were determined. All of the items in our analysis have kurtosis and skewness within the permitted range (normal data skewness between -2 and +2 and kurtosis between -7 and +7, Hair & Alamer, 2022). Internal reliability was confirmed using Cronbach's Alpha, and then the composite reliability (CR) and the average variance extracted (AVE) were determined. These tests were employed to confirm internal consistency and convergent validity, ensuring that the indicators reliably reflect their respective latent constructs.

To gain a deeper comprehension of the residents' characteristics and how they felt about the development and conservation of sustainable tourism, descriptive statistics were used. These

descriptive results, combined with the reliability and factor structure analyses, establish a solid empirical basis for the model.

Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM) were conducted in IBM SPSS AMOS. Model fit was evaluated with indices including GFI, CFI, RFI, AGFI, SRMR, NFI, TLI, and RMSEA. Hypotheses were subsequently tested based on the validated model.

5. Results

Among the total sample of the local GSRS population, 39.70% are male and 60.30% are female, with an average age of 46 years (Table 2). Most of respondents are between 50-59 years old. The majority of residents are employed (66%), have completed high school (40.80%) and higher education (43.80%). The largest number of inhabitants are employed in the private sector and the public sector, but a large number are also engaged in agriculture. The majority reside in a home with three to five members, and most have lived in this area for over 50 years.

Table 2. *Sociodemographic attributes of the respondents (n=365)*

Characteristic	Category	n (%)
Gender	Male	145 (39.7)
	Female	220 (60.3)
Age group	<19	2 (0.5)
	20-29	56 (15.3)
	30-39	48 (13.2)
	40-49	100 (27.4)
	50-59	120 (32.9)
	≥ 60	39 (10.6)
Education level	Elementary school	17 (4.7)
	High school	149 (40.8)
	Bachelor's degree	160 (43.8)
	Master's/PhD	39 (10.7)
Employment status	Student	33 (9.0)
	Employed	241 (66.0)
	Unemployed	61 (16.7)
	Retiree	30 (8.2)
Type of job	Agriculture	60 (16.4)
	Public sector	69 (18.9)
	Private sector	105 (28.8)
	Tourism	21 (5.8)
	Artisan	28 (7.7)
	Nature protection	13 (3.6)
Household size	Other	69 (18.9)
	< 3	96 (26.3)
	3-5	176 (48.2)
	> 5	93 (25.5)
Municipality/City	Ivanjica	101 (27.7)
	Kraljevo	168 (46.0)
	Raška	58 (15.9)
	Novi Pazar	24 (6.6)
	Sjenica	14 (3.8)
Length of Residency	< 9 years	9 (2.5)
	10-19 years	11 (3.0)
	20-29 years	67 (18.4)
	30-39 years	86 (23.6)
	40-49 years	76 (20.8)
	≥ 50 years	116 (31.8)

Residents of the following municipalities/cities were included: Ivanjica (27.70%), Sjenica (3.80%), Raška (15.90%), Novi Pazar (6.6%) and Kraljevo (46.0%). Regarding the sample, it is important to note that while the cities sampled in this study are geographically and demographically diverse, they may not fully represent the broader population of the region. The sample was selected based on specific criteria related to the focus on sustainable tourism and community engagement, which could introduce some bias. However, the cities chosen are representative of areas where sustainable tourism initiatives have been more actively promoted, and they offer valuable insights into the relationship between sustainable tourism and community behavior. Future studies could expand the sample to include a broader range of locations to better capture variability in community responses to tourism.

Given that the alpha values of all dimensions are above the recommended value of 0.70 (Hair *et al.*, 2021), it is considered that acceptable internal consistency has been achieved (Table 3).

A confirmatory factor analysis (CFA) in IBM SPSS AMOS demonstrated good model fit ($\chi^2/df = 2.13$; RMSEA = 0.056; SRMR = 0.026; CFI = 0.988; TLI = 0.965) and supported our 41-item, 10-factor structure. Although AGFI was slightly below the 0.90 threshold (0.855), it remains above 0.80—an acceptable level for exploratory research (Hair *et al.*, 2014; Kline, 2016)—and further modification risked overfitting. Convergent validity was confirmed by significant factor loadings (0.51–0.92), average variance extracted (AVE > 0.50), and construct reliability (CR = 0.77–0.91) (Hair *et al.*, 2021; Cheung *et al.*, 2024). The tourism involvement scale (CR = 0.77) falls slightly below 0.80 but still indicates adequate reliability for hypothesis testing.

Table 3. Descriptive statistics and measurement model validity

Variables	Mean	Cronbach's alpha	AVE	CR
PE	4.31	0.922	0.505	0.835
SE	3.78	0.943	0.686	0.853
PTE	2.75	0.896	0.587	0.848
ECE	3.62	0.902	0.611	0.825
ENVE	3.35	0.753	0.620	0.867
TI	3.85	0.728	0.535	0.772
PRSTD	3.20	0.905	0.524	0.865
SUPP	4.48	0.964	0.714	0.908
QOL	4.14	0.917	0.633	0.894
WTC	4.05	0.923	0.633	0.872

The estimate of discriminant validity is provided in Table 4 by contrasting the average variance extracted (AVE) for each latent variable with the estimation of the correlation among the latent constructs. Rönkkö & Cho (2022) state that an AVE extracted that is greater than the correlation value is a discriminant validity sign. The results indicate that the examined dimensions show sufficient discriminant validity.

In order to determine whether the correlations of indicators across constructs measure distinct phenomena, the Heterotrait-Monotrait Ratio (HTMT) was then assessed (Henseler *et al.*, 2015). Every inter-construct correlation was below the 0.85 cutoff, as Table 4 demonstrates.

Since the results showed the model's construct validity, as well as discriminant validity and reliability, further data analysis and hypothesis testing can be done. Based on the SEM model and CFA analysis (Table 5), the hypotheses were evaluated.

Table 4. Discriminant Validity Test based on Fornell-Larcker Criterion and Heterotrait-Monotrait Ratio (HTMT)

	PE	SE	PTE	ECE	ENVE	TI	STD	SUPP	QOL	WTC
PE	0.711	0.618	0.469	0.584	0.668	0.638	0.585	0.644	0.600	0.572
SE	0.673	0.828	0.570	0.414	0.667	0.753	0.555	0.550	0.571	0.425
PTE	0.431	0.528	0.766	0.503	0.724	0.225	0.764	0.258	0.370	0.360
ECE	0.533	0.382	0.462	0.782	0.739	0.662	0.584	0.484	0.451	0.507
ENVE	0.616	0.554	0.725	0.598	0.787	0.543	0.727	0.550	0.630	0.761
TI	0.689	0.635	0.446	0.538	0.679	0.731	0.695	0.673	0.634	0.684
PRSTD	0.529	0.506	0.700	0.523	0.590	0.602	0.724	0.373	0.603	0.711
SUPP	0.599	0.400	0.242	0.449	0.406	0.608	0.322	0.845	0.733	0.598
QOL	0.557	0.532	0.361	0.413	0.493	0.589	0.440	0.791	0.796	0.522
WTC	0.527	0.399	0.337	0.469	0.552	0.667	0.550	0.556	0.485	0.796

Note: The bold diagonal elements are the squared root of the AVE. Above-diagonal elements are the HTMT ratio; below-diagonal elements are correlations between the constructs for Fornell and Larcker.

Table 5. Proposed relationship between the constructs (SEM)

Hypothesis	Relationship	Beta	Std.Error	C.R.(t)	Status of hypothesis
H1a	PE to TI	0.250*	0.050	4.983	Supported
H1b	SE to TI	0.276*	0.035	5.876	Supported
H1c	PTE to TI	-0.171*	0.033	-3.492	Supported
H1d	ECE to TI	0.128*	0.031	3.038	Supported
H1e	ENVE to TI	0.420*	0.050	7.484	Supported
H2a	PE to SUPP	0.495*	0.068	7.736	Supported
H2b	SE to SUPP	0.021	0.047	0.351	Not supported
H2c	PTE to SUPP	-0.112*	0.045	-1.792	Supported
H2d	ECE to SUPP	0.198*	0.042	3.683	Supported
H2e	ENVE to SUPP	0.053	0.068	0.733	Not supported
H3a	PE to PRSTD	0.210*	0.074	3.938	Supported
H3b	SE to PRSTD	0.042	0.051	0.847	Not supported
H3c	PTE to PRSTD	0.559*	0.049	10.699	Supported
H3d	ECE to PRSTD	0.183*	0.046	4.081	Supported
H3e	ENVE to PRSTD	-0.077	0.073	-1.289	Not supported
H4a	PE to WTC	0.236*	0.074	3.681	Supported
H4b	SE to WTC	0.036	0.051	0.598	Not supported
H4c	PTE to WTC	-0.146*	0.049	-2.328	Supported
H4d	ECE to WTC	0.158*	0.046	2.941	Supported
H4e	ENVE to WTC	0.398*	0.073	5.536	Supported
H5	STD to QOL	0.440*	0.040	9.345	Supported
H6	STD to WTC	0.550*	0.036	12.546	Supported
H7	TI to SUPP	0.608*	0.044	14.587	Supported

Community empowerment was confirmed to be a significant predictor of tourist involvement (β from -0.171 to 0.420, statistically significant). This means that people who live in the GSBR area and feel empowered are more involved in tourist activities. However, it is the opposite regarding political empowerment (H1c confirmed but negative). This negative effect may reflect specific socio-political dynamics within the region, potentially tied to perceptions of governance, participation, or trust in local leadership.

Besides being a predictor of tourist involvement, community empowerment is a significant predictor of tourism support (all but social and environmental empowerment). Residents who are psychologically ($\beta=0.495$; statistically significant) and economically ($\beta=0.198$; statistically significant) empowered are much more prone to support further development of tourism. However, those who are politically empowered will support tourism less. The findings show no statistical significance regarding social and environmental empowerment (H2b and H2e not confirmed).

A significant predictor of a proactive role in sustainable tourism is community empowerment. Locals who are psychologically ($\beta=0.210^*$), economically ($\beta=0.183^*$), and politically empowered ($\beta=0.559^*$) are more likely to take a proactive role in sustainable tourism initiatives. However, social and environmental empowerment were not found to be statistically significant predictors (H3b and H3e not confirmed). These findings suggest that while empowerment in certain areas (psychological, economic, political) fosters proactive involvement in sustainable tourism, other forms of empowerment (social, environmental) may not have a direct influence in this context. Further exploration of these relationships is needed to understand the nuanced impacts of different types of empowerments on sustainable tourism behaviors. It is possible that individuals in different socio-economic positions perceive or experience empowerment differently, which may explain the varying impacts observed.

"Willingness to conserve" is defined as the local community's openness to engaging in actions that support the preservation and sustainable management of cultural and natural resources. It is operationalized through measures assessing residents' attitudes towards conservation practices, their support for policies promoting environmental protection, and their participation in conservation activities, such as willingness to participate in conserving natural and cultural resources.

The study finds that empowerment plays a significant role in predicting the community's willingness to conserve. Specifically, individuals who feel psychologically ($\beta = 0.236^*$), economically ($\beta = 0.183^*$), and environmentally ($\beta = 0.398^*$) empowered are more likely to engage in conservation activities (H4a, c, e supported). However, political empowerment is found to have a negative effect on willingness to conserve ($\beta = -0.146^*$), suggesting that higher levels of political empowerment may reduce community members' engagement in conservation efforts. The negative impact of political empowerment on tourism involvement and willingness to conserve (H1c, H4c) is an important finding that warrants further discussion. This result may be influenced by socio-political factors that shape the community's relationship with local governance and tourism initiatives. In many contexts, higher political empowerment can lead to a sense of political disillusionment or a mistrust in government if residents feel that political leaders or local authorities do not adequately address community needs or priorities. This could result in disengagement from tourism-related activities and conservation efforts, as people may perceive these initiatives as being controlled or manipulated by political elites without meaningful community participation. This negative association may also reflect tensions between political structures and local conservation priorities, where empowered individuals may become critical or skeptical of institutional conservation agendas. Further investigation into how political agency is exercised and perceived within the community may offer a clearer explanation.

Notably, social empowerment was found to have no significant impact on willingness to conserve (H2 not supported). This highlights that the willingness to conserve is strongly linked to empowerment, particularly when residents feel psychologically, economically, and environmentally empowered through sustainable tourism initiatives. These findings suggest that sustainable tourism can act as a powerful driver of conservation behavior when it enhances local communities' sense of empowerment. A significant predictor of life quality and willingness to conserve resources is a proactive role in sustainable tourism (H5 and H6 confirmed). Engagement and participation in sustainable tourism activities lead to improved quality of life, and people are more eager to engage in conservation activities.

Local communities' active participation in tourism activities is an essential component of BRs sustainable tourism, conservation, and the SDGs achievement. Locals who are involved in tourism possess a more positive view of supporting tourism development (H7 confirmed).

The non-significant relationships (H2b, H2e, H3b, H3e, H4b) regarding social empowerment, environmental empowerment, and their influence on support for tourism development, proactive roles in sustainable tourism, and willingness to conserve may be attributed to several contextual factors. In some communities, social and environmental empowerment might not have an immediate impact on these outcomes, particularly if residents feel disconnected from the decision-making processes or do not perceive direct benefits from tourism initiatives. Differences in residents' socio-economic background, including education, income, or employment status, could also play a role in shaping how empowerment is perceived and its subsequent effects. Additionally, local socio-political dynamics or limited access to resources could reduce the effectiveness of empowerment efforts in fostering participation in tourism and conservation. Future research could explore the role of local governance, community cohesion, or economic dependency on tourism as potential moderators influencing these relationships.

6. Discussion

Based on the significance of community empowerment to the SDGs, this study selected GSBR to investigate the influence of community empowerment on factors such as sustainable tourism, tourism involvement, support, and willingness to conserve. The empirical findings confirmed most of the proposed hypotheses (some of them were partially supported). This study highlights that community empowerment plays a crucial role in advancing several SDGs, such as Goal 8 (Decent Work and Economic Growth), Goal 11 (Sustainable Cities and Communities), and Goal 13 (Climate Action), by fostering greater tourism involvement and resource conservation. However, external factors, such as economic pressures, limited infrastructure, and competing development priorities, may impact the ability of local communities to fully engage in sustainable tourism practices and conservation efforts. These factors can constrain the positive effects of empowerment and must be considered when developing policies aimed at supporting sustainable tourism and community-based conservation. This paper further demonstrates that community empowerment can boost their tourism involvement, tourism support, and perspective toward sustainable tourism, as well as their willingness to conserve the resources of BR.

To enable coexistence and harmony between people and nature, sustainable development with adequate protection and preservation of resources is necessary. One of the necessary conditions for this in BR is certainly the local community empowerment (Petriello *et al.*, 2024; Wani *et al.*, 2024). In addition to enabling the local community development and prosperity, empowerment also enables the preservation of the biosphere reserve (Scheyvens & van der Watt, 2019). The findings of the survey of the local community of GSBR showed that psychological empowerment is the highest (mean value 4.31). This means that they are proud residents of this area and believe that tourism provides them with a sense of community (social empowerment 3.78). The local community believes that tourism not only brings business opportunities (economic empowerment 3.62) but also enables involvement in conservation (environmental empowerment 3.35). Given that political empowerment (2.75) is quite low, it is essential to find a way on the part of the authorities and the creators of tourism policy to raise it. The study's findings align with those of Petriello *et al.* (2024) and Wani *et al.* (2024), particularly regarding the role of community empowerment in sustainable development and conservation. However, in the context of GSBR, low political empowerment (2.75) emerges as a significant barrier. This finding contrasts with other studies where political engagement is linked to positive outcomes. In GSBR, the lack of political empowerment limits local communities' involvement in decision-making, which may hinder their support for tourism development and conservation efforts. The absence of

political power diminishes their influence over tourism policies and projects that directly affect their lives, often leaving them feeling excluded from critical decisions. This issue is more than a gap in participation – it represents a structural challenge to achieving a truly community-driven, sustainable tourism model. Addressing this political gap is crucial for ensuring that tourism policies align with local needs and sustainable practices.

Although the current low level of political empowerment may limit community involvement in decision-making, increasing political empowerment can have positive outcomes by enhancing local participation in tourism planning, leading to more sustainable and community-driven development. Thus, it follows that the local GSBR community is still not considered fully involved in making decisions for the development of tourism and believes that their voice is not heard much. This lack of political agency may lead the community to seek alternative forms of involvement in tourism, such as supporting conservation efforts even in the absence of direct involvement in decision-making processes. The results showed that the empowerment of the local community leads to their willingness to engage in tourism and resource conservation activities, as well as support the further sustainable development of tourism (Hypotheses 1-4). These outcomes confirm those of Han *et al.* (2024), who believed that empowered local communities are more inclined to endorse tourism-related projects that fit with their goals, beliefs, and interests, which increases support for sustainable tourism. These results align with the research conducted by Mayak *et al.* (2020) that communities that are empowered feel more in charge of and in control of the tourism-related activities that take place in their area. These hypotheses were partially confirmed because it was determined that social and environmental empowerment does not lead to support for tourism or sustainable development, and social empowerment does not lead to readiness for involvement in resource conservation activities. This lack of significance could be due to external factors such as insufficient awareness of the long-term benefits of sustainable tourism, limited access to resources or training, or broader socio-political challenges that hinder community engagement. These factors may overshadow the direct impact of social and environmental empowerment, limiting their effectiveness in fostering support for tourism or conservation activities. The lack of significance in social and environmental empowerment (H2b, H2e) may be due to the socio-political context, where social empowerment alone doesn't directly impact tourism or conservation without supportive political and economic structures. Environmental empowerment may be less impactful because conservation is often seen as the responsibility of authorities, not local communities.

Conversely, however, it was established that if political empowerment is low, the local population will continue to support tourism and will be involved in conservation and tourism activities. It is possible that the local population knows the importance of the resources of the GSRB and believes that even if they are not fully involved in decision-making, they know the importance of sustainable development for the preservation of resources. Studies have shown that even in the absence of direct involvement, communities often have a strong sense of environmental responsibility and understand the benefits of sustainable practices (e.g., Arnstein, 1969). Low political empowerment, however, is linked to stronger support for tourism and conservation, as communities may seek to assert their influence in areas where they feel politically marginalized. Future research should focus on which types of tourism involvement—such as planning or ecotourism programs—most influence local support for development.

The findings of the current study showed that ST increases the local community QOL (H5), and their willingness to engage in protection (H6). As previous studies have shown (Benckendorff *et al.*, 2009; Manzoor *et al.*, 2019), ST can greatly improve locals' QOL by generating employment possibilities, protecting cultural assets, and promoting community development and promoting tourism-related enterprises (Lordkipanidze *et al.*, 2005). By employing ST to spark interest in traditional crafts, music, dance, and cuisine, cultural traditions that might otherwise be lost can be preserved (Stanikzai *et al.*, 2024). The current study results are supported by Baloch *et al.* (2022) that local communities'

willingness to protect their cultural and natural resources can be greatly impacted by ST. According to Scheyvens (1999), when communities see tangible benefits from ST, they are willing to take part in protecting their environment and heritage for future generations which our study also supports.

As the results showed, when the locals participate in tourism related activities, it is reflected in their further support for development (H7 confirmed). The local population of the GSRB believes that tourism and its promotion must be actively supported. The dimension of tourism support has a very high mean value (over 4), and it is good to know that GSRB has a population that is proud of it and believes that tourism can lead to its preservation. These results support the results of Gautam & Bhalla (2024) and Han *et al.* (2023), who found that the involvement of residents is a crucial factor that influences residents' support for tourist development.

The current study's findings identified a comprehensive tourist development approach that includes interconnected elements such as QOL, ST, local community empowerment, tourism involvement and support, and resource conservation. It was determined that community empowerment is highly predictive of sustainable tourism and willingness for conservation. Developing tourism destinations that benefit locals and tourists alike while protecting the cultural legacy and the environment for future generations requires empowering communities, encouraging active engagement, and supporting sustainable practices. These findings offer a new light on destination development that is sustainable, as communities feel more empowered and show more interest in sustainable development when they feel appreciated and a part of it.

7. Conclusion

A sustainable and balanced future depends on the cooperation of local communities, the SDGs, empowerment, sustainable tourism, and conservation. By using a community empowerment strategy, the current study aims to contribute to the body of information regarding biosphere reserves as destinations for tourism. The current study validated the framework's capacity to define sustainable tourism and community empowerment. The current study demonstrates the causal relationship between community empowerment and its descendants. The study's conclusions support the idea that we can solve global issues and advance a more just and resilient world by empowering communities and incorporating sustainable practices into tourism and conservation. For local governments and administrators, these findings provide a clear roadmap for integrating community empowerment into policy and decision-making processes, ensuring that tourism development is aligned with local needs and sustainable practices.

In summary, GSRB community members showed that when they feel empowered, they are willing to participate more in tourist-related and conservation efforts and support sustainable tourism. In addition to helping to achieve the SDGs, GSRB might profit from sustainable tourism if its local populations feel empowered in every manner. These goals can be met by cooperating with the local government, residents, and other GSRB stakeholders. This is the only way that GSRB can continue to be supported and sustainably transformed.

7.1. Theoretical contributions

This study makes a significant theoretical contribution by advancing the understanding of community empowerment within the context of biosphere reserves, particularly in tourism settings. This study contributes to the body of knowledge on biosphere reserves, community empowerment, and sustainable tourism in several ways. First off, no previous research has investigated the suggested conceptual study model, which incorporates all the components of empowerment (environmental, social, political, economic, and psychological) as well as elements like support, willingness to conserve, and sustainable tourism. This is the first study to address these constructs in such a comprehensive way,

providing a novel theoretical framework that other researchers can build upon. The study also contributes to bridging the gap in literature by investigating the interconnectedness of various empowerment dimensions and their influence on sustainable tourism in biosphere reserves, a critical area that has been underexplored. Consequently, earlier studies examined the connection between community empowerment and the aforementioned constructs; however, they did not incorporate all the constructs and encompass all aspects of empowerment. The findings open new avenues for future research in this area and provide a foundation for further theoretical development in the study of empowerment in biosphere reserves and tourism contexts. The study thus advances theoretical understanding by presenting a holistic view of how community empowerment can shape the future of tourism in biosphere reserves.

7.2. Practical implications

The study's findings offer significant practical implications. One specific recommendation is for local governments to use these findings to design targeted empowerment programs that address the key factors influencing community participation, such as education, training, and resource availability. One of the key challenges in the GSBR is the relatively low level of political empowerment within local communities. Political empowerment is crucial for ensuring that local communities have a say in the decision-making processes related to tourism and conservation policies, particularly in biosphere reserves where long-term sustainability is a priority. To address this, it is important to strengthen the channels for local participation in political and governance structures. This can be achieved by establishing regular consultations between local residents and public authorities, ensuring that community members are represented in decision-making bodies related to tourism and conservation. Additionally, training programs aimed at enhancing political awareness and skills could empower community leaders to advocate for local needs more effectively. Improving transparency in governance and ensuring that local concerns are addressed in policy development are also essential steps in enhancing political empowerment. Local governments can also consider implementing participatory budgeting or other collaborative policy development processes to ensure that local communities have a direct role in shaping the policies that affect them. These efforts would contribute to a more inclusive approach to sustainable tourism development, where local voices are integral to shaping the future of the GSBR.

Furthermore, GSBR administrators and the public enterprise “Srbijašume” should foster active resident engagement by promoting educational programs, community meetings, and collaborative projects that advance tourism, conservation, and development. Aligning village and municipal governance with the biosphere reserve's management structures is essential; regular coordination meetings can ensure policies reflect local needs and drive progress toward the SDGs. Finally, “Srbijašume” can translate this research into practice by tailoring strategies and marketing campaigns that highlight community empowerment and safeguard GSBR's cultural and natural resources for future generations.

Additionally, it's important to consider how the local government structure—comprising villages and municipalities—aligns with the biosphere reserve's management structure and the authorities responsible for its conservation. The coordination between local government and the GSBR management will be crucial in implementing sustainable tourism practices.

7.3. Limitations and Future Research

One study drawback is that the respondents were limited to locals; however, additional groups, such as government representatives, managers, and tourism officials, may be added in future research for multi-group analysis. By including these stakeholder groups, future research could offer a more comprehensive understanding of community empowerment across different perspectives, highlighting the roles each group plays in sustainable tourism development. Future research should consider a mixed-methods design, combining surveys with interviews or focus groups to capture both broad trends

and in-depth perspectives on community empowerment in biosphere reserves. This study found that the relationships between sustainable tourism, quality of life, and conservation behavior are primarily direct, as the tested mediators and moderators were statistically insignificant. While this underscores the direct role of sustainable tourism in enhancing quality of life and fostering conservation behavior, it also highlights a limitation in capturing potential indirect effects or contextual factors. Investigating alternative mediators or moderators, such as social capital or institutional trust, could reveal deeper insights into the relationships between sustainable tourism, quality of life, and conservation behavior. Future research should explore alternative mediators or moderators and consider qualitative approaches to uncover deeper insights into these relationships.

This study is geographically limited to the Golija Studenica Biosphere Reserve (GSBR), and the findings might differ in other regions or types of biosphere reserves due to variations in local socio-cultural, political, and environmental conditions. Conducting studies in different biosphere reserves with diverse socio-cultural, political, and environmental contexts would help validate the findings and enhance the generalizability of the study across various regions. The impact of community empowerment on sustainable tourism development may vary across different biosphere reserves, and the results cannot be generalized to all biosphere reserves without further research in diverse geographical contexts. Additionally, multi-group analysis could yield a more comprehensive understanding of the factors influencing community empowerment in different stakeholder groups, providing nuanced insights into how these groups interact and contribute to sustainable tourism.

Future studies should explore similar models in other biosphere reserves or natural protected areas to validate or refine these findings. The study's emphasis on sustainable development, resource conservation, and advocacy for community empowerment demonstrate that the environment and people can coexist in BRs. The study's conclusions can be utilized by policymakers and community members to draft regulations and take other useful steps that will empower communities more and support and encourage environmental preservation and sustainable development.

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