

Influence of Residents' Biospheric Values on Environmentally Responsible Behaviour at Saiwa Swamp National Park

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Abstract

Saiwa Swamp National Park's biodiversity is threatened by sand harvesting, riverbank cultivation, and the removal of bulrush grass by residents living adjacent to the park. Understanding how the environmental values held by residents shape their behavioural responses is key for promoting environmentally responsible actions. This study investigates the influence of residents' biospheric values on environmentally responsible behaviour at Saiwa Swamp National Park, Kenya. Guided by the Value-Belief-Norm (VBN) framework, a correlational research design was employed, and data were collected using closed-ended questionnaires from 384 adult residents sampled through systematic random sampling from a target population of 53,994 residents living adjacent to the park. Descriptive and inferential statistics were used to analyse data. Pearson correlation analysis revealed a strong, significant positive relationship between biospheric values and environmentally responsible behaviour ($r = 0.734$, $p < 0.01$). Multiple regression analysis indicated that the model explained 61.8% of the variance in ERB ($R^2 = 0.618$), with biospheric values emerging as a strong significant positive predictor ($\beta = 0.416$, $p = 0.001$). The findings demonstrate that residents who strongly endorse biospheric values prioritizing pollution prevention, unity with nature, and environmental protection are significantly more likely to engage in civic, educational, and leadership actions that support conservation. The study recommends that the Kenya Wildlife Service implement targeted environmental education initiatives emphasising ecological stewardship, biodiversity protection, and pollution prevention across all age groups via schools and community forums. Integrating value-based frameworks into national conservation policies is advised to strengthen biospheric orientations and promote sustained environmentally responsible behaviour in protected area communities.

Keywords: Biospheric values, environmentally responsible behaviour, Saiwa Swamp National Park, wetland conservation, residents

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Introduction

Wetlands rank among the most productive ecosystems on Earth, yet they are also among the most threatened. The Global Wetland Outlook 2025 reports that natural wetlands have declined three times faster than forests since 1970, with more than 411 million hectares lost globally and a quarter of all wetland species facing extinction (Ramsar Convention on Wetlands, 2025).

In Kenya, wetlands cover approximately 3–4% of the land area and underpin critical ecosystem services; nevertheless, unsustainable use, agricultural conversion, and pollution have severely compromised their integrity (Onganya, 2023; Gubamwoyo, 2025). Recent contingent-valuation research along Lake Victoria further demonstrates that local residents recognise the value of wetland conservation and are willing to contribute financially to biodiversity protection, underscoring the key role of community engagement in sustaining these ecosystems (Mamboleo & Adem, 2023).

Saiwa Swamp National Park, Kenya's smallest protected area at only 3 km², exemplifies this conservation challenge. Gazetted in 1974 to safeguard the endangered semi-aquatic Sitatunga antelope (*Tragelaphus spekei*) and the crowned crane (*Balearica regulorum*), the swamp is fed by the Sinyerere and Kapenguria rivers and supports more than 185 bird species and numerous mammals (Owiti et al., 2024). Despite its ecological significance, the park faces acute anthropogenic pressures. Adjacent farming communities engage in intensive maize and wheat cultivation, and agrochemical runoff, riparian encroachment, riverbank erosion, illegal grazing, and the harvesting of bulrush grass for cattle feed and thatching material have degraded habitat quality and reduced native vegetation (Ndiema, 2021; Owiti et al., 2024). Park wardens and regional media confirm that these retrogressive agricultural activities and human–wildlife interactions particularly crop raiding by monkeys are pushing the park toward ecological collapse. Such

patterns mirror broader dynamics in Kenyan protected areas, where frequent human–wildlife conflict erodes community resilience, amplifies livelihood vulnerability, and complicates state-led conservation mandates (Chepkwony et al., 2025).

Against this backdrop, scholars have increasingly turned to psychosocial frameworks to explain why some residents engage in conservation-oriented behaviours while others do not. Empirical evidence consistently affirms that biospheric values are the strongest positive predictor of pro-environmental intentions and actions. For example, Hong et al. (2024) found that biospheric values significantly and positively influenced Chinese youths' green consumption intentions within a VBN framework. Likewise, Alashiq and Aljuhmani (2025) showed that biospheric values amplify the effects of sustainability messaging on environmental knowledge and eco-destination image, rendering individuals more responsive to ecological cues. Experimental work by Anicker et al. (2024) further established that higher biospheric value prioritisation predicts stronger pro-environmental behavioural intentions across both private and public choice contexts.

Environmentally responsible behaviour (ERB) in protected-area contexts is typically operationalised through civic actions (e.g., attending environmental meetings, boycotting harmful companies), educational actions (e.g., seeking information on conservation, viewing environmental media), and leadership actions (e.g., persuading peers to conserve water, refraining from disturbing wildlife) (Smith-Sebasto & D'Costa, 1995; Zheng & Zhang, 2024). These behaviours extend beyond private-sphere choices to include collective and politically oriented engagement essential for wetland co-

management. Yet, although residents around Saiwa Swamp acknowledge the interrelatedness of their livelihood activities and the park's natural resources and even recognise that their farming practices threaten the swamp this awareness has not consistently translated into sustained conservation action (Owiti et al., 2024). This suggests biospheric concern may exist among adjacent communities, but its influence on ERB remains insufficiently understood in this specific socio-ecological setting.

Despite the documented ecological crisis at Saiwa Swamp National Park and the acknowledged dependence of adjacent communities on wetland ecosystem services, there is a paucity of empirical research isolating the influence of residents' biospheric values on their environmentally responsible behaviour. Existing Kenyan wetland studies have focused largely on willingness to pay, land-use change, or human–wildlife conflict, while recent studies has been concentrated among tourists, youth consumers, or urban populations in Asia and Europe. Consequently, park managers and the Kenya Wildlife Service lack evidence-based guidance on whether strengthening biospheric values among local residents can predictably enhance civic participation, environmental learning, and leadership behaviours around the park. Without such knowledge, conservation interventions risk misaligning educational campaigns and incentive structures with the actual motivational drivers of the adjacent community. This study therefore examines the influence of residents' biospheric values on environmentally responsible behaviour at Saiwa Swamp National Park, testing the hypothesis **H₀₁**: *There is no significant influence of residents' biospheric values on environmentally responsible behaviour.*

Literature Review

Environmentally Responsible Behaviour

Environmentally responsible behaviour (ERB) refers to any individual or collective action directed toward the remediation of environmental issues and problems (Sivek & Hungerford, 1990; Zheng & Zhang, 2024). Because such behaviours consciously aim to minimise negative impacts on the natural and built environment, they are regarded as essential levers for sustainable development (Lee et al., 2013). To operationalise the construct, Smith-Sebasto and D'Costa (1995) proposed six dimensions including educational, civic, financial, legal, physical, and persuasive actions of which this study adopts civic actions (e.g., attending environmental meetings, petitioning for conservation), educational actions (e.g., seeking information on conservation, viewing environmental media), and leadership actions (e.g., persuading peers to conserve water, refraining from disturbing wildlife). These dimensions capture behaviours that extend beyond private-sphere consumption choices to include collective and politically oriented engagement essential for co-managing protected ecosystems.

In developing countries, ERB is particularly consequential because residents must balance conservation imperatives against immediate subsistence needs. Mamboleo and Adem (2022) found that 40.9% of households adjacent to Lake Victoria were willing to contribute financially to wetland conservation, and those who derived direct benefits from the lake were more inclined to pay, suggesting that value-based connections to ecosystems can translate into concrete commitments when institutional mechanisms exist. Yet Laban (2025) documented a persistent value-behaviour gap in Kenya's Upper

Yala River watershed: although 94.5% of households recognised the wetland as a permanent water source, agricultural land use dominated at 93.0%, revealing the tension between environmental awareness and livelihood dependence. At Saiwa Swamp National Park, this tension is especially acute. Ngeno et al. (2014) established that residents' support for conservation-oriented tourism depends on tangible benefits and involvement in decision-making, while Kang et al. (2024) reported that 99% of adjacent residents endorsed obeying conservation laws and 85% supported community involvement in policy formulation. Nevertheless, 55% still endorsed traditional agricultural practices, and positive attitudes have not consistently translated into sustained civic, educational, or leadership actions (Owiti et al., 2024). What remains unexamined is whether the psychosocial mechanisms specifically residents' biospheric values can bridge this attitude-behaviour gap at Saiwa Swamp.

Biospheric Values

According to Han and Oh (2021), environmental value orientation refers to the way individuals prioritise and relate to environmental issues based on their personal values. Biospheric values specifically reflect concern for non-human living things and the broader natural environment, prioritising the inherent worth of nature independent of human welfare (Steg & De Groot, 2012; Stern et al., 1993). Stern and Dietz (1994) first established that environmental concern is rooted in these three orientations, with biospheric concern emerging as the most robust predictor of environmentally significant action a finding validated cross-culturally by Schultz (2001) across samples from the United States, Brazil, and the Czech Republic. De Groot and Steg (2008, 2009) subsequently developed reliable

scales for these orientations and demonstrated that biospheric values consistently predict willingness to accept environmental policies and engagement in pro-environmental behaviour even when demographic and ideological variables are controlled.

In a large-scale study of Chinese university students, biospheric values showed the strongest positive effect on environmental attitudes and the highest total effect on pro-environmental behaviour, operating primarily through attitude mediation (Chen & Erfanian, 2026). Similarly, Sehar et al. (2025) found that biospheric values significantly influenced pro-environmental attitudes among faculty in Southern Pakistan, with social influence positively moderating the value–attitude relationship. In addition, Li and Wu (2022) compared tourists and hikers in Wuyishan National Park, China, and found that hikers who typically exhibit stronger biospheric orientations demonstrated pro-environmental behaviour driven by internal demand and personal connection to nature rather than by external social pressure. Extending this to resident populations, Zhang et al. (2024) examined communities adjacent to Qianjiangyuan National Park using an extended VBN model that incorporated assigned values of ecosystem services. Their model explained 39.8% of the variance in environmentally responsible behaviour, with personal pro-environmental norms emerging as the strongest direct predictor ($\beta = .521$), while biospheric and altruistic values significantly predicted ecological worldviews.

Despite this growing body of evidence, the biospheric value–ERB pathway has not been empirically tested among residents living adjacent to an African wetland protected area. Existing Kenyan wetland research has documented willingness to pay, land-use

change, and community awareness (Laban, 2025; Mamboleo & Adem, 2022), yet the specific influence of biospheric values on remains unexamined at Saiwa Swamp National Park.

Theoretical Framework

This research adopted the Value-Belief-Norm (VBN) theory to understand the environmentally responsible behaviours of the residents in Saiwa Swamp National Park. Stern's Value-Belief-Norm theory of environmentalism outlines a sequence of five key variables that shape the types of actions people take: values, the New Ecological Paradigm (NEP), awareness of consequences (AC), ascription of responsibility (AR), and personal norms (PN) (Stern, 2000; Stern et al., 1995). According to Schwartz (1992) value orientation refers to a guiding principle that determines desirable or appropriate states or outcomes.

Methodology

Study Area

The research was conducted at Saiwa Swamp National Park, Kenya's smallest national park. The park is a unique wetland due to its vast biodiversity, water source, ecological balance, tourism and conservation, and cultural importance. The swamp is situated in Trans-Nzoia County and is 2.9 km long and an average of 0.3 km wide with a perimeter of 25 km. Two rivers feed the swamp: Kipsaina and Kapenguria. The park was first designated as a bird sanctuary in 1972 and gazetted as a National Park in 1974, especially for the protection of the endangered species, Speke's sitatunga and the de Brazza monkey. Saiwa Swamp National Park is also the only gazetted breeding and roosting site for the crowned crane in Kenya. The swamp is rich in biodiversity with about 185 species of birds, 26 species

of mammals, 3 species of fish, 3 snake species, several reptiles and amphibians, 660 higher plant species with 405 vascular plants. The park has a latitude of 1.1° and 1.3° North and longitude 35.1° or 35.2° East. The park experiences wet and dry climate, ranging from warm to cool and humid, with rainfall peaking around April, August, and November, and an annual average of 1,250 mm.

Research Design

The study applied a correlational research design. This design helps predict scores and explain the relationship among variables. In correlational research designs, correlational statistical tests are employed to quantify and examine the strength and direction of the relationship between variables (Creswell, 2005; Devi et al., 2022). A quantitative approach was used by collecting data through questionnaires.

Target Population and Sampling

The study targeted 53,994 residents living adjacent to Saiwa Swamp National Park, including Sinyerere ward (14,517), Kipsaina ward (7,752), and Sitatunga ward (31,725) (KNBS, 2019). Cochran's (1963) formula was used to determine the sample size, assuming maximum variability of $p = 0.5$ and a 95% confidence level with $\pm 5\%$ margin of error:

$$n = (1.96)^2 \times (0.5)(0.5) / (0.05)^2 = 384$$

Systematic random sampling was employed, involving selecting every 10th household in each ward surrounding Saiwa Swamp National Park. The sample was distributed as follows: Kipsaina (55), Sitatunga (226), and Sinyerere (103). Prior to the main data collection, 39 respondents were used in pretesting to ensure validity and reliability. These pretest respondents were excluded from the main study.

Data Collection Instrument

The main data collection instrument was a closed-ended questionnaire. A five-point Likert scale was used. For biospheric values, the scale ranged from 1 (Extremely unimportant) to 5 (Extremely important). For environmentally responsible behaviour, the scale ranged from 1 (Strongly disagree) to 5 (Strongly agree). The biospheric values construct comprised items measuring preventing pollution (conserving natural resources), unity with nature (fitting into nature), and protecting the environment (preserving nature). The environmentally responsible behaviour construct comprised civic actions, educational actions, and leadership actions.

Validity and Reliability

The questionnaire was designed in line with the research hypotheses and pretested using 39 respondents to uncover and address any issues. During actual data collection, respondents who had participated in the pretest were excluded. Reliability was tested using Cronbach's alpha coefficient. For biospheric values, Cronbach's alpha was 0.856 (excellent). For the dependent variable dimensions, civic actions achieved 0.882, leadership actions 0.874, and educational actions 0.847. The overall reliability for all 24 items was 0.912.

Data Analysis

Descriptive statistics were computed using measures of central tendency and standard deviation. Before conducting multiple regression analysis, diagnostic tests were performed: normality test (Kolmogorov-Smirnov and Shapiro-Wilk), linearity test (scatterplots), homogeneity of variances test (Levene's test), multicollinearity test (Variance Inflation Factor and tolerance values), and autocorrelation test (Durbin-Watson

statistics). Multiple regression analysis was used to determine the relationship between biospheric values and environmentally responsible behaviour. The regression model applied was:

$$Y = b_0 + b_1X_1 + e$$

Where Y = environmentally responsible behaviour, X_1 = biospheric values, and e = error term.

Results

Response Rate

A total of 384 questionnaires were distributed, of which 324 were

returned, representing a response rate of 84.4%. Of the 324 returned questionnaires, 7 were found to have missing values across key variables and were excluded through listwise deletion, yielding 317 usable questionnaires for data analysis. This response rate exceeds the minimum threshold of 70% recommended by Mugenda and Mugenda (2003).

Demographic Profile of Respondents

The demographic characteristics of the 317 respondents are presented in Table 1 below.

Table 1: Demographic Profile of Respondents

Demographic Variable	Category	<i>n</i>	%
Level of Education	Primary	17	5.4
	Secondary	147	46.4
	College	72	22.7
	Undergraduate	65	20.5
	Masters	16	5.0
Gender	Male	180	56.8
	Female	137	43.2
Age	Below 30 years	199	62.8
	31–40 years	95	30.0
	41–50 years	23	7.2
Occupation	Student	168	53.0
	Employed (full-time)	66	20.8
	Employed (part-time)	30	9.5
	Self-employed	27	8.5
	Unemployed	15	4.7
	Retired	6	1.9
	Other	5	1.6
Distance from Park	Less than 1 km	89	28.1
	1–3 km	142	44.8
	3–5 km	63	19.9
	Above 5 km	23	7.2
Duration of Residence	Less than 5 years	76	24.0
	5–10 years	108	34.1
	11–20 years	95	30.0
	Above 20 years	38	11.9
Frequency of Park Visits	Once	121	38.2
	2–5 times	145	45.7
	6–10 times	35	11.0
	More than 10 times	16	5.1
Observed Grazing in Park	Yes	203	64.0
	No	114	36.0
Received Environmental Guidelines	Yes	127	40.1
	No	190	59.9

The majority had secondary education (46.4%), followed by college (22.7%) and undergraduate (20.5%). Males comprised 56.8% and females 43.2%. The majority were below 30 years of age (62.8%). Students constituted the largest occupational category (53.0%), followed by full-time employees (20.8%). Most respondents resided between 1 and 3 kilometres from the park (44.8%), with 28.1% living less than 1 kilometre away. The largest group had lived in the area for 5 to 10 years (34.1%). Most respondents visited the park between 2 and 5 times

(45.7%). A majority (64.0%) had observed livestock grazing inside the park. Notably, 59.9% had not received any environmental guidelines about the park.

Descriptive Statistics

Descriptive statistics were computed to examine the central tendency and distribution of responses for the study variables. Table 2 presents the descriptive statistics for the independent variable, biospheric values, measured on a 5-point scale ranging from 1 (*Extremely unimportant*) to 5 (*Extremely important*).

Table 2: Descriptive Statistics for Residents' Biospheric Values

Item	<i>M</i>	<i>SD</i>
Preventing pollution (Conserving natural resources)	4.28	0.76
Unity with nature (Fitting into nature)	4.13	0.80
Protecting the environment (Preserving nature)	4.27	0.74
Overall Biospheric Values	4.23	0.77

Note. Response scale: 1 = Extremely unimportant, 2 = Unimportant, 3 = Neutral, 4 = Important, 5 = Extremely important.

The results indicate a strong biospheric value orientation among residents. Preventing pollution recorded the highest mean score ($M = 4.28$, $SD = 0.76$), followed closely by protecting the environment ($M = 4.27$, $SD = 0.74$). Unity with nature achieved a somewhat lower but still high mean ($M = 4.13$, $SD = 0.80$). Across all three items, the vast majority of respondents rated biospheric values as either important or extremely important, suggesting that concern for the natural environment is strongly endorsed within this community.

Table 3 presents the descriptive statistics for the dependent variable, environmentally responsible behaviour, operationalised through three dimensions (civic actions, educational actions, and leadership actions) measured on a 5-point scale ranging from 1 (*Strongly disagree*) to 5 (*Strongly agree*). The results for environmentally responsible behaviour reveal moderate to high levels of

engagement across the three dimensions. Among civic actions, talking with friends about environmental problems recorded the highest mean ($M = 3.84$, $SD = 0.97$), while volunteer work recorded the lowest ($M = 3.29$, $SD = 1.15$). For educational actions, watching television programs on environmental issues achieved the highest mean ($M = 3.77$, $SD = 1.00$), whereas willingness to pay increased taxes for environmental protection recorded the lowest mean ($M = 3.11$, $SD = 1.20$). Within leadership actions, the item reflecting intent not to disturb creatures or vegetation received the highest mean score overall ($M = 3.95$, $SD = 0.93$), while persuading others to reuse envelopes received the lowest ($M = 3.36$, $SD = 1.13$). These findings suggest that residents are most inclined toward low-intensity leadership and interpersonal behaviours and least inclined toward actions requiring financial sacrifice or formal organisational commitment.

Table 3: Descriptive Statistics for Environmentally Responsible Behaviour

Dimension / Item	Scale	<i>M</i>	<i>SD</i>
Civic Actions			
I boycott (protest) companies with an un-ecological background	1–5	3.38	1.09
I attend a residents' meeting that involves concern over a local environmental issue	1–5	3.65	1.05
I talk with friends (parents) about problems related to the environment	1–5	3.84	0.97
I do volunteer work for a group that helps the environment	1–5	3.29	1.15
I join residents' cleanup efforts	1–5	3.62	1.09
Educational Actions			
I watch TV programs on environmental issues	1–5	3.77	1.00
I would be willing to pay more taxes in order to protect the environment	1–5	3.11	1.20
I learn about the recycling facilities in my area	1–5	3.67	1.04
I donate money/time to support an environmental organization	1–5	3.26	1.16
I read books, publications and other materials on environmental issues	1–5	3.62	1.07
Leadership Actions			
I tell my companions not to feed animals	1–5	3.85	0.99
I have/can persuade someone to conserve water	1–5	3.72	1.03
I have/can persuade someone to sign a petition regarding an environmental issue	1–5	3.48	1.10
I have/can persuade someone to reuse envelopes by putting a label over the old address	1–5	3.36	1.13
I do not intend to disturb any creature or vegetation	1–5	3.95	0.93

Note. Response scale: 1 = Strongly disagree, 2 = Disagree, 3 = Not sure, 4 = Agree, 5 = Strongly agree

Diagnostic Tests

Before regression analysis, several assumptions were tested. Normality tests (Kolmogorov-Smirnov and Shapiro-Wilk) yielded non-significant results for all variables ($p > 0.05$), confirming normal distribution. The scatterplot of standardized residuals against standardized predicted values revealed random dispersion around zero, confirming linearity. Levene's test for homogeneity of variances yielded non-significant results for all variables ($p > 0.05$), confirming constant variance. Multicollinearity diagnostics showed tolerance values of 0.612 for biospheric values and VIF of 1.634, well within acceptable limits (tolerance > 0.10 ; VIF < 10). The Durbin-Watson statistic was

1.987, close to 2.0 and indicating no autocorrelation.

Correlation Analysis

Pearson correlation analysis revealed a strong positive and statistically significant relationship between biospheric values and environmentally responsible behaviour ($r = 0.734$, $p < 0.01$), indicating that residents who place high importance on protecting the environment, preventing pollution, and maintaining unity with nature are significantly more likely to engage in environmentally responsible behaviours.

Regression Analysis

Multiple regression analysis was conducted to determine the influence of

environmental value orientations on environmentally responsible behaviour. The model summary (Table 4) indicates that the multiple correlation coefficient (R) was 0.786, with $R^2 = 0.618$, meaning

that 61.8% of the variance in environmentally responsible behaviour can be explained by the value orientations. The adjusted R^2 was 0.614.

Table 4: Model Summary

Model R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.786	0.618	0.42158	1.987

The ANOVA results (Table 5) showed that the regression model was statistically significant: $F(3, 313) = 169.728$, $p < 0.001$

Table 5: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	90.482	3	30.161	169.728	0.001
Residual	55.621	313	0.178		
Total	146.103	316			

The regression coefficients (Table 6) revealed that biospheric values had the largest unstandardized coefficient ($B = 0.416$, $SE = 0.052$) and the strongest

standardized beta coefficient ($\beta = 0.428$) among all predictors. This was statistically significant ($t = 8.015$, $p = 0.001$).

Table 6: Regression Coefficients

Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	0.842	0.215		3.916	0.001
Biospheric Values	0.416	0.052	0.428	8.015	0.001

For every one-unit increase in biospheric values, environmentally responsible behaviour increases by 0.416 units when other variables are held constant. The standardized beta of 0.428 indicates that biospheric values have the strongest relative influence on environmentally responsible behaviour.

The null hypothesis stated that there is no significant influence of residents' biospheric values on environmentally responsible behaviour. The coefficient for biospheric values ($B = 0.416$, $p < 0.001$) was statistically significant with $t = 8.015$, exceeding the

critical value of 1.96 at the 0.05 significance level. Therefore, the null hypothesis is rejected. Residents' biospheric values have a significant positive influence on environmentally responsible behaviour.

Discussion

The study findings revealed that residents living around Saiwa Swamp National Park held strong biospheric values, with positive attitudes toward preventing pollution, unity with nature, and protecting the environment. The

correlation analysis demonstrated a strong positive relationship between biospheric values and environmentally responsible behaviour, indicating that residents with higher biospheric values were significantly more likely to engage in environmental conservation actions. The regression analysis confirmed that biospheric values had a significant positive influence on environmentally responsible behaviour at the 0.05 significance level, emerging as the strongest predictor among all value orientations examined.

These findings are consistent with the Value-Belief-Norm (VBN) theory proposed by Stern (2000), which posits that biospheric values are fundamental determinants of environmentally responsible behaviour. According to Stern, Dietz, and Kalof (1993), biospheric value orientation reflects concern for nonhuman species and the broader ecosystem, and individuals with strong biospheric values assess behaviours based on their impact on ecosystems and the biosphere. The strong influence of biospheric values observed in this study aligns with research by De Groot and Steg (2008), who found that biospheric values are generally stronger predictors of pro-environmental beliefs, norms, and actions compared to other value orientations. Similarly, Lee and Jan (2015) demonstrated that biospheric values significantly influence nature-based recreationists' engagement in both site-specific and general environmentally responsible behaviours.

The strong biospheric values demonstrated by residents may be attributed to several contextual factors specific to Saiwa Swamp National Park. As noted by Macharia, Thenya, and Ndiritu (2010), wetlands are rich in biodiversity and serve as important sources of food, water, medicinal plants, and materials for local communities. The close proximity of residents to the park and their direct

dependence on its ecosystem services may have fostered awareness of environmental issues and appreciation for the park's ecological value. Furthermore, Terer et al. (2004) observed that some communities use wetland sites for cultural and spiritual rituals, which may strengthen biospheric values by reinforcing the sacred connection between people and nature.

However, despite strong biospheric values among residents, the study revealed persistent environmental challenges at Saiwa Swamp National Park, including cultivation, sand harvesting, and bulrush grass harvesting as documented by Ndiema (2021). This gap between values and actual environmental conditions suggests that while biospheric values are necessary for promoting environmentally responsible behaviour, they may not be sufficient without complementary interventions such as enhanced environmental education, stricter enforcement of park regulations, and provision of alternative livelihood opportunities that reduce residents' dependence on park resources.

The finding that biospheric values was a strong predictor ($\beta = 0.428$) supports the argument by Steg and De Groot (2012) that biospheric values play a key role in promoting pro-environmental beliefs, norms, and behaviours. The prominence of biospheric values suggests that environmental considerations are deeply tied to people's moral frameworks, reflecting a commitment to protecting both human and nature rights (Steg, Lindenberg & Keizer, 2016).

Conclusion

The study concludes that biospheric values have a significant and strong positive influence on environmentally responsible behaviour among residents living around Saiwa Swamp National Park. Residents who prioritize environmental protection, and unity with the natural

world are substantially more likely to engage in civic actions, educational actions, and leadership actions aimed at conservation. Biospheric values emerged as a strong predictor of environmentally responsible behaviour demonstrating that for every unit increase in biospheric values, environmentally responsible behaviour increases significantly, holding other factors constant.

Recommendations

Given that biospheric values is a strong predictor of environmentally responsible behaviour among residents, Kenya Wildlife Service and park management should develop comprehensive environmental education programs emphasizing the intrinsic value of nature and biodiversity conservation. These programs should target residents of all ages through schools, community centers, and public forums, utilizing documentaries, workshops, nature walks, and interpretive materials to further strengthen these already strong biospheric values and translate them into consistent conservation practices.

Since the majority of residents reported observing illegal grazing within the park despite strong environmental values, park management should address persistent violations such as illegal grazing, sand harvesting, and bulrush grass collection through integrated approaches combining enforcement, education, and alternative livelihood provision. This addresses the identified gap between residents' values and actual behaviours, suggesting that economic pressures override value orientations when survival needs are at stake.

The Ministry of Tourism and Wildlife should incorporate value-based frameworks into national conservation policies and protected area management plans. Policies should recognize that biospheric values motivate

environmentally responsible behaviour through distinct pathways, requiring tailored intervention strategies that emphasize protecting the environment, preventing pollution, and respecting the Earth via schools and community forums, using engaging materials and activities that reach all age groups.

Areas for Further Research

Future research should examine longitudinal changes in biospheric values under different conservation interventions and test the effectiveness of various environmental education approaches in strengthening these values. Additionally, comparative studies across multiple protected areas would clarify how cultural beliefs and local socio-economic conditions influence residents' biospheric values and environmentally responsible behaviour.

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