



From Environmental Awareness to Action: Governance and Livelihood Constraints on Sustainable Wetland Management in Masaba South Sub-County, Kenya

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DOI: <https://doi.org/10.68050/JAMS.2026.664>

Received: 28 September 2026; Accepted: 05 October 2026; Published: 14 October 2026

ABSTRACT

Wetland conservation remains challenging where communities recognize the importance of environmental protection but depend on wetland resources for their livelihoods. This study examined environmental awareness, community participation, governance and livelihood conditions in relation to sustainable wetland management in Masaba South Sub-County, Kisii County, Kenya. A descriptive cross-sectional mixed-methods design was used. The initial household sample was 384 respondents. Of 380 questionnaires administered, 352 were completed and returned, giving a response rate of 92.6%. Quantitative data were collected using a household questionnaire, while qualitative information was obtained through key informant interviews, focus group discussions and field observations. Quantitative data were analysed using descriptive statistics, mainly frequencies and percentages, while qualitative data were analysed thematically. Environmental awareness programmes received 67% agreement, community participation 65%, and policy enforcement 55%. Respondents also expressed strong support for controlled farming, wetland restoration and community education, each at 75%, while 72% supported alternative livelihoods. Qualitative findings indicated that conservation support existed alongside concerns about policy enforcement, limited institutional support, poverty, land scarcity and limited livelihood alternatives. The findings indicate an awareness-to-action gap in which environmental knowledge and willingness to conserve do not necessarily translate into conservation practice where households face governance and livelihood constraints. Sustainable wetland management should therefore combine environmental education and meaningful community participation with consistent institutional support, effective application of wetland regulations and practical livelihood options for wetland-dependent households.

Keywords: environmental awareness; governance; livelihood constraints; community participation; sustainable wetland management; socio-ecological systems

INTRODUCTION

Wetlands are among the most important ecosystems for both environmental sustainability and human well-being. They regulate water flows, support biodiversity, store carbon, contribute to food security and provide resources that sustain millions of livelihoods. Despite these functions, wetlands continue to experience substantial loss and degradation. The *Global Wetland Outlook 2025* reports that approximately 22% of global wetlands have been lost since 1970 and about one-quarter of the remaining wetlands are in poor ecological condition. Agricultural expansion, pollution, infrastructure development and hydrological disruption are among the interacting pressures contributing to this decline (Convention on Wetlands, 2025). These trends make sustainable wetland management particularly important in rural areas where households depend directly on wetland resources.

The conservation challenge is especially complex in sub-Saharan Africa because wetland protection frequently intersects with household livelihood needs. Communities may depend on wetlands for cultivation, water, grazing and other resources while simultaneously recognizing the environmental consequences of continued exploitation. Environmental awareness is therefore important, but knowledge of environmental problems does



not necessarily result in conservation action. Recent evidence from natural-resource management in sub-Saharan Africa shows that community participation is shaped by interconnected economic, social, institutional and governance conditions rather than environmental knowledge alone (Imbo et al., 2026). Similarly, evidence from participatory water governance indicates that sustainable resource management requires institutional arrangements that connect community knowledge and participation with effective governance structures (Kah et al., 2026). This gap between environmental knowledge and action has also been reported in the wider environmental behaviour literature. Kollmuss and Agyeman (2002) found that environmental knowledge does not always lead to pro-environmental behaviour because people face both personal and external barriers. Bamberg and Möser (2007) similarly found that environmental behaviour is influenced by attitudes, intentions, social norms and people's ability to act. More recent evidence shows that environmental concern is related to pro-environmental behaviour, but concern alone does not fully explain whether people take action (Lou & Li, 2023).

This tension is particularly evident where households have limited livelihood alternatives. People may recognize the need to conserve an ecosystem but continue resource-use practices when their food production, income or water access depends on that ecosystem. Evidence from Yala Wetland in western Kenya illustrates this challenge. Studies have shown that local communities have considerable interest in sustainable wetland management while remaining strongly dependent on wetland resources and agricultural livelihoods (Maua et al., 2022). This suggests that willingness to conserve should not automatically be interpreted as the practical capacity to adopt sustainable practices. Similar findings have been reported elsewhere in East Africa. Kabumbuli and Kiwazi (2009) found that wetland conservation among poor wetland-dependent communities in Uganda needed to be linked with participatory management and alternative livelihoods. In Kenya, Nasongo et al. (2015) showed that access to and use of wetland resources were closely linked to livelihood needs and the institutions that governed resource use. These studies show that conservation choices need to be understood within the livelihood conditions facing wetland-dependent households.

Community participation presents a related challenge. Participation can strengthen local ownership, incorporate local knowledge and improve the legitimacy of environmental decisions. Its effectiveness, however, depends on the extent to which communities meaningfully influence resource-management processes. Research from Yala Wetland shows that community involvement may occur through local organizations, public meetings and other participatory structures without necessarily providing communities with substantial influence over major management decisions (Odero & Odenyo, 2022). More recent evidence from sub-Saharan Africa similarly demonstrates that effective participation depends on governance quality, institutional relationships, incentives and the distribution of the costs and benefits associated with natural-resource management (Imbo et al., 2026).

Governance is therefore central to understanding the relationship between environmental awareness and conservation action. Environmental policies and conservation programmes may have limited practical effect when enforcement is inconsistent, institutional capacity is inadequate or communities have insufficient influence over management decisions. At the same time, conservation measures that restrict resource use without addressing livelihood dependence may be difficult to implement and sustain. Effective wetland management consequently requires governance arrangements that regulate environmentally harmful practices while creating realistic opportunities for resource-dependent households to adopt more sustainable livelihood strategies (Odero & Odenyo, 2022; Imbo et al., 2026). Evidence from Tanzania also shows that weak institutional coordination, limited resources and inadequate stakeholder involvement can constrain sustainable wetland management (Mkonda, 2022).

These relationships can be understood through the Socio-Ecological Systems (SES) framework, which conceptualizes resource systems, resource users and governance arrangements as interacting components rather than separate entities (Ostrom, 2009). Conservation outcomes therefore emerge from interactions between ecological conditions, livelihood decisions, institutions and collective action. Recent African studies support the use of this approach in wetland research. Tuji et al. (2024) used a socio-ecological systems perspective to examine the links between wetland ecosystem services, land-use change and human activities in Ethiopia. Okyere et al. (2026) also examined the links between natural resources, local livelihoods and multi-



stakeholder governance in Ghana's Muni-Pomadze Ramsar Site. This perspective is particularly useful where communities depend economically on the same ecosystems that conservation interventions seek to protect.

Masaba South Sub-County provides an appropriate setting for examining these relationships. Wetlands in the area support agriculture and other household livelihood activities while experiencing continuing pressure from human use. The study found that awareness programmes received 67% agreement regarding their effectiveness and community participation received 65%, whereas policy enforcement recorded a lower level of agreement at 55%. These findings indicate that environmental awareness and participation are more positively perceived than institutional enforcement. The study further identified poverty, land scarcity, limited livelihood alternatives and weaknesses in governance as important constraints affecting the implementation of sustainable wetland management practices.

Existing wetland studies have generated substantial knowledge on ecosystem degradation, community participation, livelihood dependence and environmental governance. However, less attention has been given to explaining the gap between knowing that wetlands should be conserved and having the practical capacity to act on that knowledge, particularly in smaller rural wetland systems in Kenya. This distinction is important because conservation programmes that concentrate primarily on environmental awareness may achieve limited results when the institutional and livelihood conditions influencing resource-use decisions remain unresolved.

Accordingly, this paper examines how governance and livelihood constraints shape the translation of environmental awareness into sustainable wetland management practices in Masaba South Sub-County, Kenya. Rather than treating inadequate conservation primarily as an environmental awareness deficit, the paper investigates the conditions under which awareness and willingness are converted into practice. It therefore contributes to wetland-management scholarship by conceptualizing the conservation challenge as an awareness-to-action gap shaped by governance capacity and livelihood constraints.

LITERATURE REVIEW AND THEORETICAL FRAMING

Environmental Awareness and Community Participation in Wetland Management

Environmental awareness is widely regarded as an important foundation for sustainable natural-resource management because communities are more likely to support conservation when they understand ecosystem functions and the consequences of environmental degradation. In wetland-dependent communities, awareness may include knowledge of declining water availability, soil degradation, biodiversity loss and the longer-term effects of unsustainable cultivation and resource extraction. However, awareness represents knowledge and perception rather than conservation action itself. Whether people act on that knowledge depends on the economic, institutional and social conditions under which resource-use decisions are made.

The difference between environmental awareness and actual behaviour has been widely discussed in environmental research. Blake (1999) described a value-action gap in which people may support environmental protection but fail to act because of practical and institutional barriers. Kollmuss and Agyeman (2002) similarly found that environmental knowledge alone does not necessarily lead to pro-environmental behaviour because action is influenced by both personal and external factors. Bamberg and Möser (2007) further showed that attitudes, intentions, social norms and people's ability to act influence environmental behaviour. More recent evidence confirms that environmental concern is positively related to pro-environmental behaviour, although concern alone does not determine whether people take action (Lou & Li, 2023). These studies support the need to distinguish between knowing about an environmental problem and having the ability to respond to it.

Recent evidence from sub-Saharan Africa demonstrates that community participation in natural-resource management is influenced by a combination of governance, economic, social and resource-related factors. Imbo et al. (2026), in a systematic review of community participation in collective natural-resource management in sub-Saharan Africa, found that participation is shaped by interacting conditions rather than a single determinant. This indicates that environmental knowledge may encourage conservation interest but cannot independently overcome institutional weaknesses or livelihood constraints. Evidence from African rural



communities also shows that environmental awareness can support conservation behaviour when communities have opportunities to take part in conservation activities (Montana & Mlambo, 2019). Awareness is therefore more useful when people also have practical opportunities to act on what they know.

The quality of participation is equally important. Community attendance at meetings or receipt of conservation information does not necessarily constitute meaningful involvement in environmental governance. Research from Yala Wetland in Kenya found that community participation initially remained largely at the lower levels of informing and consultation and was rated poorly in terms of effectiveness (Odero & Odenyo, 2022). The study showed that stronger participatory structures could improve involvement and ownership of wetland-management decisions. This distinction between being informed and having meaningful influence is important because sustainable management requires communities to participate not only as recipients of environmental messages but also as actors in decision-making and implementation. Participation therefore needs to provide communities with a practical role in decisions concerning the resources on which their livelihoods depend.

Governance and Institutional Constraints on Conservation Action

Governance determines how environmental rules are developed, communicated, enforced and accepted by resource users. In wetland management, governance includes the institutions responsible for conservation, the consistency of policy enforcement, coordination among agencies and the extent to which communities participate in decisions. Where these arrangements are weak, environmental awareness may have limited influence on actual resource-use practices.

Evidence from Kenya illustrates the importance of these institutional conditions. Odero and Odenyo (2021) found that community participation in the planning and management of Yala Wetland was weakened by gaps in stakeholder involvement and decision-making processes. Their later work showed that stronger participatory arrangements improved community involvement and created better opportunities for local people to contribute to wetland management (Odero & Odenyo, 2022). Research from the Nyando Papyrus Wetland provides a related perspective. Nasongo et al. (2015) found that access to and use of wetland resources occurred within different formal and informal institutional arrangements involving several actors and interests. Their findings indicate that wetland management extends beyond formal conservation rules to the institutions and relationships through which those rules operate.

The presence of regulations does not by itself ensure effective wetland management. Their practical value depends on whether they are understood, applied consistently and supported by institutions with sufficient capacity to monitor wetland use. Where implementation is irregular or monitoring is limited, environmentally harmful practices may continue even among communities that understand their effects. Research from Tanzania similarly identified institutional limitations and stakeholder-related challenges in wetland management (Mkonda, 2022).

Governance in wetland management should therefore be assessed by how institutions function in practice, not simply by the existence of policies and regulations. Clear institutional responsibilities, coordination, consistent enforcement and meaningful community participation provide the conditions within which conservation measures can be implemented. Where these conditions are limited, communities may understand the need for wetland protection but still encounter difficulties in putting conservation measures into practice.

Livelihood Constraints and the Awareness-to-Action Gap

Livelihood dependence is important in understanding why environmental awareness may not result in sustainable resource use. In many rural areas, wetlands provide land for cultivation, water, grazing and other resources that support household needs. Communities may therefore understand the environmental effects of wetland degradation while continuing to use wetlands because they have few practical alternatives.

Research from Kenya illustrates this tension. Maua et al. (2022), in their study of Yala Swamp, found that local communities recognized the importance of wetland conservation while also depending on the wetland for their livelihoods. This created a difficult choice between protecting the ecosystem and meeting immediate



household needs. A related situation was reported in the Nyando Papyrus Wetland, where access to wetland resources was closely connected to livelihood interests and the institutions regulating resource use (Nasongo et al., 2015). Continued use of wetland resources should therefore not automatically be interpreted as lack of environmental knowledge or unwillingness to conserve. Households may understand the need for conservation while having limited options for reducing their dependence on wetlands.

The same tension has been observed elsewhere in Africa. Kabumbuli and Kiwazi (2009) found that wetland management among poor wetland-dependent communities in Uganda needed to incorporate participatory planning and alternative livelihood opportunities. Nyumah and Brambilla (2025) similarly examined the challenge of balancing habitat conservation with community livelihoods. Both studies draw attention to the practical difficulty of reducing resource use when households lack realistic alternatives for meeting their livelihood needs.

In this context, poverty, land scarcity and limited livelihood alternatives can restrict the choices available to wetland-dependent households. The awareness-to-action gap may therefore reflect constraints on people's capacity to change their practices rather than an absence of environmental concern. This distinction matters because programmes centred mainly on increasing environmental knowledge may have limited practical value when the economic conditions influencing wetland use remain unresolved.

Wetland conservation programmes should consequently consider the livelihood circumstances within which households make resource-use decisions. Alternative livelihood opportunities, appropriate skills and practical support may provide households with greater scope to reduce activities that place pressure on wetlands. Such measures are best considered alongside, rather than as substitutes for, effective environmental governance.

Socio-Ecological Systems Theoretical Framing

The study was guided by Ostrom's Socio-Ecological Systems (SES) framework, which provides a way of examining the relationships between natural resources, resource users and the institutions that govern resource use. Ostrom (2009) argues that the sustainability of natural-resource systems cannot be understood by examining ecological or social conditions separately. Attention must also be given to the interactions among the resource system, users, governance arrangements and the wider social and environmental setting.

This framework is appropriate for wetland management because wetlands provide ecological functions while also supporting household livelihoods. Decisions about wetland use are therefore made within a setting where conservation needs, livelihood demands and institutional rules interact. In Masaba South, environmental awareness may influence how people view wetland conservation, but the extent to which conservation measures can be put into practice may also depend on household livelihood conditions and the way wetland-management institutions operate.

Recent studies illustrate the usefulness of this approach in examining resource-management problems. Tuji et al. (2024) applied an SES perspective to the Boyo Wetland in Ethiopia and linked changes in wetland ecosystem services with human activities and land-use change. Okyere et al. (2026), studying Ghana's Muni-Pomadze Ramsar Site, examined natural-resource use, local livelihoods and multi-stakeholder governance within the same management setting. These studies show the value of considering ecological resources, livelihood needs and governance arrangements as connected elements rather than separate issues.

Drawing on the SES framework, the present study considers environmental awareness and willingness to conserve within the governance and livelihood conditions surrounding wetland use. The analytical relationship guiding the study is expressed as follows:



Environmental awareness → willingness to conserve → governance and livelihood conditions → implementation of conservation measures → wetland-management outcomes.

The pathway is used as an analytical guide rather than as a tested causal model. Because the study employed a descriptive cross-sectional design, the relationships identified in the data are interpreted as patterns and reported associations at the time of the study. They are not used to establish that one condition caused another.

METHODOLOGY

Study Area

The study was conducted in Masaba South Sub-County, Kisii County, Kenya. The area contains wetlands that support agriculture and other household livelihood activities. Local communities use wetland resources for cultivation, water, grazing and other livelihood needs. The dependence of local households on these resources made the area appropriate for examining environmental awareness, community participation, governance, livelihood conditions and sustainable wetland management.

Research Design

The study used a descriptive cross-sectional mixed-methods design. Quantitative data were collected through a household questionnaire, while qualitative information was obtained through key informant interviews, focus group discussions and field observations. The mixed-methods approach allowed quantitative patterns to be considered alongside participants' experiences and accounts of wetland use and management (Creswell & Plano Clark, 2018).

The cross-sectional design provided information on conditions during the study period. It was appropriate for describing patterns within the study population but was not intended to establish cause-and-effect relationships.

Target Population

The target population consisted of approximately 8,000 small-scale farmers and other wetland users in Masaba South Sub-County. These were households whose farming and livelihood activities brought them into direct contact with wetlands and wetland resources.

The qualitative component included participants with relevant knowledge or experience of wetland use and management. They included community leaders and elders, chiefs and assistant chiefs, agricultural extension officers, environmental officers, representatives of non-governmental and community-based organizations, and long-term residents of the study area.

Sample Size and Sampling Procedures

The initial household sample size was 384 respondents, determined using Cochran's sample-size approach (Cochran, 1977). A total of 380 questionnaires were administered, of which 352 were completed and returned, giving a response rate of 92.6%. The 352 completed questionnaires formed the quantitative dataset used in the analysis.

Household respondents were selected using probability-based sampling. Eligible wetland users were identified within the study area, after which systematic sampling was used to select respondents for the household survey. Systematic sampling provided a structured procedure for selecting eligible respondents from the sampling frame (Cochran, 1977).

Participants in the qualitative component were selected purposively according to their roles, experience and knowledge of wetland use and management. They included community leaders and elders, local administrators, agricultural extension officers, environmental officers, representatives of relevant organizations



and long-term residents. These participants provided information on community participation, governance, livelihood pressures and wetland-management practices.

Data Collection Methods and Instruments

The household questionnaire was the main instrument used to collect quantitative data. It covered environmental awareness, community participation, policy enforcement, livelihood conditions and views on sustainable wetland-management practices. Structured items allowed respondents to indicate their level of agreement with statements relating to the main issues examined in the study.

Key informant interviews were used to obtain information from participants with direct knowledge of wetland governance, community activities and environmental management. Focus group discussions provided community views and shared experiences concerning wetland use, conservation and livelihood challenges. Field observations provided additional information on wetland conditions and resource-use activities.

Information obtained through these methods was considered alongside the household survey results, allowing similarities and differences in participants' accounts to be identified during interpretation.

Pilot Study

The research instruments were piloted at Tente Wetland in Nyamira County using 10 respondents. The pilot site was outside the main study area and was used to assess the clarity, wording, sequence and suitability of questionnaire items before the main data collection. Respondents who participated in the pilot were not included in the main household survey.

Issues identified during the pilot were addressed before the questionnaire was administered in Masaba South.

Validity and Reliability

The questionnaire was reviewed to determine whether its items adequately addressed the study objectives and the main issues under investigation. Particular attention was given to the clarity and relevance of questions on environmental awareness, community participation, governance, livelihood conditions and wetland-management practices. Feedback from the review and pilot study was used to improve the instrument before the main data collection.

Reliability was assessed using Cronbach's alpha for relevant multi-item measures. Cronbach's alpha provides a measure of the internal consistency of items intended to assess the same construct (Cronbach, 1951; Tavakol & Dennick, 2011). A coefficient of 0.70 or above was considered acceptable for the study, consistent with the commonly applied criterion for research scales (Nunnally & Bernstein, 1994). The reliability analysis yielded a Cronbach's alpha coefficient of 0.78, indicating acceptable internal consistency of the relevant multi-item measures. Cronbach's alpha was applied only to related items intended to measure the same construct rather than to unrelated questionnaire items.

Data Analysis

Quantitative data were coded and analysed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics, mainly frequencies and percentages, were used to summarize respondents' views on environmental awareness, community participation, policy enforcement and sustainable wetland-management practices. The results were presented in tables and accompanying text.

Qualitative data from key informant interviews and focus group discussions were organized and analysed thematically. Recurring views and experiences were grouped under themes relating to awareness, participation, governance, livelihood constraints and wetland management. The qualitative findings were used to provide context for patterns identified in the household survey rather than to assign numerical prevalence to participants' qualitative views.



Quantitative and qualitative findings were considered together during interpretation where they addressed related issues. Because the study was cross-sectional and the quantitative analysis was mainly descriptive, the findings were treated as reported patterns and associations rather than evidence of cause-and-effect relationships.

Ethical Considerations

Participation in the study was voluntary. Respondents were informed about the purpose of the study and their right to decline or withdraw from participation. Participants' privacy and confidentiality were protected during data collection, analysis and reporting. Information collected from participants was used only for the purposes of the study.

Ethical approval for the study was obtained from Kisii University, and a research permit was obtained from the National Commission for Science, Technology and Innovation (NACOSTI) before data collection. Participants gave informed consent before taking part in the study.

RESULTS

Environmental Awareness, Community Participation and Policy Enforcement

The study examined respondents' views on environmental awareness programmes, community participation and policy enforcement in wetland management. Table 1 presents the responses.

Table 1: Respondents' Views on Environmental Awareness, Community Participation and Policy Enforcement

Aspect	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)	Agreement (%)
Community participation	30	35	15	12	8	65
Policy enforcement	25	30	18	15	12	55
Awareness programmes	35	32	12	10	11	67

For awareness programmes, 35% of respondents strongly agreed and 32% agreed that the programmes were effective, giving a combined agreement of 67%. A further 12% were neutral, while 21% disagreed or strongly disagreed. Most respondents therefore had a positive view of environmental awareness programmes, although a notable proportion did not share this view.

Community participation recorded 65% agreement, with 30% strongly agreeing and 35% agreeing. Fifteen percent were neutral, while 20% disagreed or strongly disagreed. Most respondents viewed community participation positively, although the responses also indicate differences in how participation was experienced.

Policy enforcement received 55% agreement, comprising 25% who strongly agreed and 30% who agreed. Eighteen percent were neutral, while 27% disagreed or strongly disagreed. Policy enforcement therefore received lower agreement than either awareness programmes or community participation.

The responses reveal a clear difference across the three aspects examined. Awareness programmes recorded the highest agreement at 67%, followed by community participation at 65% and policy enforcement at 55%. Positive views of environmental awareness and community participation therefore existed alongside less favourable views of policy enforcement.



Support for Sustainable Wetland Management Practices

Respondents were asked to indicate their level of support for selected practices that could contribute to sustainable wetland management. The practices included controlled farming, wetland restoration, community education and alternative livelihoods. Table 2 presents the responses.

Table 2: Respondents' Support for Sustainable Wetland Management Practices

Sustainable wetland-management practice	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)	Agreement (%)
Controlled farming	45	30	10	8	7	75
Wetland restoration	40	35	10	8	7	75
Community education	42	33	12	7	6	75
Alternative livelihoods	38	34	12	9	7	72

Controlled farming received 75% agreement, with 45% of respondents strongly agreeing and 30% agreeing. Ten percent were neutral, while 15% disagreed or strongly disagreed. Most respondents therefore supported greater control of farming activities within wetland areas.

Wetland restoration also recorded 75% agreement. Forty percent strongly agreed and 35% agreed, while 10% were neutral and 15% disagreed or strongly disagreed. This indicates substantial support for restoring degraded wetland areas.

Community education received the same level of agreement at 75%, comprising 42% who strongly agreed and 33% who agreed. Twelve percent were neutral, while 13% disagreed or strongly disagreed. Most respondents therefore supported continued community education on wetland conservation and sustainable use.

Alternative livelihoods recorded 72% agreement, with 38% strongly agreeing and 34% agreeing. Twelve percent were neutral, while 16% disagreed or strongly disagreed. Although the level of agreement was slightly lower than for the other three practices, more than seven out of every ten respondents supported alternative livelihood opportunities.

The responses indicate strong support for all four wetland-management practices examined. However, the percentages represent respondents' expressed support for the proposed practices and should not be interpreted as evidence that these practices had already been adopted.

Governance and Livelihood Constraints

The household survey findings were considered alongside information from key informant interviews and focus group discussions to examine the conditions surrounding wetland management in Masaba South. Participants frequently referred to policy enforcement, institutional support and household livelihood pressures when describing difficulties associated with sustainable wetland use.

Policy enforcement received 55% agreement in the household survey, compared with 67% for environmental awareness programmes and 65% for community participation. Accounts from key informants and focus group participants also raised concerns about the enforcement of wetland regulations and the level of institutional support available for conservation activities. Participants described situations in which wetland-management rules existed but were not always applied or monitored consistently.

Livelihood conditions were another recurring concern. Participants reported that some households depended on wetlands for cultivation and other daily needs. Poverty, shortage of land and limited alternative sources of livelihood were mentioned as circumstances that made reducing dependence on wetland resources difficult. For households with limited access to productive land elsewhere, restricting wetland cultivation could affect food production and household income.



The importance attached to livelihood options was also reflected in the household survey, where 72% of respondents supported alternative livelihoods as a wetland-management measure. Qualitative accounts indicated that conservation measures were more difficult to put into practice where households had few other ways of meeting their livelihood needs.

The quantitative and qualitative findings therefore point to two sets of conditions surrounding wetland management in the study area: institutional conditions relating to enforcement and support, and household conditions relating to land and livelihoods. Respondents expressed support for wetland conservation while also reporting practical difficulties associated with implementing some conservation measures.

The Awareness-to-Action Gap

The findings reveal a difference between respondents' positive views of environmental awareness and their reported experience of the conditions needed to put conservation measures into practice. Awareness programmes received 67% agreement and community participation 65%, while policy enforcement received a lower agreement level of 55%. Respondents also expressed strong support for controlled farming, wetland restoration and community education, each at 75%, and alternative livelihoods at 72%.

These responses indicate that many respondents understood and supported measures intended to improve wetland management. However, information from key informant interviews and focus group discussions showed that support for conservation existed alongside concerns about policy enforcement, institutional support, poverty, land scarcity and limited livelihood alternatives.

For some households, wetlands provided land for cultivation and resources needed for everyday livelihoods. Participants reported that reducing wetland use could therefore be difficult where households had limited access to land or other sources of income. In such circumstances, support for conservation did not necessarily mean that households were in a position to change their resource-use practices.

The difference between the relatively positive responses on awareness and conservation measures and the reported difficulties surrounding implementation represents the awareness-to-action gap examined in this study. The findings indicate that environmental knowledge and willingness to conserve can exist alongside institutional and livelihood conditions that make conservation practices difficult to implement.

This interpretation is limited to the patterns reported by participants during the study period. The cross-sectional design does not establish that the governance and livelihood conditions identified in the study caused particular wetland-use practices.

Integrated Interpretation of the Findings

The household survey, key informant interviews and focus group discussions provided a consistent account of the main issues surrounding wetland management in Masaba South. Survey respondents expressed positive views of environmental awareness and community participation and showed strong support for controlled farming, wetland restoration, community education and alternative livelihoods. Qualitative participants, however, described difficulties associated with policy enforcement, institutional support, poverty, land scarcity and limited livelihood alternatives.

The findings distinguish between support for conservation and the practical circumstances under which conservation measures are implemented. Some households depended on wetlands for cultivation and other livelihood needs, while institutional support and enforcement were not viewed equally positively by respondents. Conservation decisions therefore occurred within both household livelihood conditions and the local governance setting.

The quantitative and qualitative evidence also complemented each other. The survey identified relatively strong support for conservation measures, while interviews and focus group discussions provided information on the difficulties participants associated with putting some of these measures into practice. This helps explain



why positive environmental attitudes and continued dependence on wetland resources were reported within the same study population.

These findings describe respondents' views and experiences during the study period. They identify patterns within the study population but do not establish causal relationships among environmental awareness, governance conditions, livelihood pressures and wetland-use practices.

DISCUSSION

Environmental Awareness Does Not Automatically Produce Conservation Action

Environmental awareness programmes received 67% agreement among respondents, indicating generally positive views of efforts to increase knowledge about wetland conservation. However, the qualitative findings showed that awareness existed alongside continued dependence on wetlands for cultivation and other livelihood needs. Environmental knowledge therefore needs to be distinguished from the practical ability to change resource-use practices.

This distinction is consistent with the environmental behaviour literature. Kollmuss and Agyeman (2002) argue that pro-environmental behaviour is influenced by a combination of internal and external factors and that environmental knowledge alone provides only a limited explanation of behaviour. Blake (1999) similarly identified a value-action gap in which environmental concern may not result in action when people encounter practical, social or institutional barriers.

Evidence from Bamberg and Möser (2007) further indicates that environmental behaviour is associated with factors such as attitudes, behavioural intentions, social norms and perceived behavioural control. Lou and Li (2023), in a meta-analysis of environmental concern and pro-environmental behaviour, also found a positive relationship between environmental concern and behaviour, while showing that the strength of this relationship varies across behavioural contexts. These studies provide a useful basis for interpreting why positive environmental views in Masaba South did not necessarily correspond with changes in wetland use.

The livelihood setting of Masaba South adds an important dimension to this interpretation. Maua et al. (2022) reported a similar tension in Kenya's Yala Swamp, where communities recognized the importance of wetland conservation while also depending on wetland resources for their livelihoods. In Masaba South, participants likewise described dependence on wetlands alongside poverty, land scarcity and limited livelihood alternatives. Continued wetland use in such circumstances cannot be interpreted solely as lack of environmental concern.

The 67% agreement on awareness programmes should therefore be understood as evidence of positive perceptions of environmental awareness rather than proof of conservation behaviour. The findings indicate that environmental knowledge forms one part of wetland management, while the circumstances under which households make livelihood and resource-use decisions also require attention.

Community Participation Requires Institutional Support

Community participation received 65% agreement, indicating that most respondents viewed local involvement in wetland management positively. However, participation should not be interpreted simply as attendance at meetings, receipt of information or consultation. Its contribution to wetland management also depends on whether communities have meaningful opportunities to influence decisions and take part in implementation and monitoring.

This distinction is evident in research from Kenya's Yala Wetland. Odero and Odenyo (2022) found that community participation had often remained at the lower levels of informing and consultation and that stronger participatory arrangements were needed to improve local involvement in wetland management. Their findings are relevant to Masaba South because positive perceptions of participation do not necessarily indicate that communities have substantial influence over management decisions.



The broader evidence from sub-Saharan Africa points in the same direction. Imbo et al. (2026) found that community participation in collective natural-resource management is shaped by interacting institutional, social, economic and resource-related conditions. Participation therefore operates within a wider governance setting rather than independently of it.

Institutional arrangements are particularly important where several actors have responsibilities or interests in the same natural resource. Nasongo et al. (2015), studying the Nyando Papyrus Wetland in Kenya, found that wetland access and use occurred within multiple formal and informal institutional arrangements. This provides useful context for Masaba South, where community involvement similarly needs to be considered alongside the institutions responsible for regulating and supporting wetland use.

The 65% agreement on community participation should therefore be interpreted together with the lower 55% agreement on policy enforcement. The difference between these responses indicates that positive perceptions of participation coexisted with less favourable perceptions of enforcement. Community participation and institutional effectiveness are related aspects of wetland management, but one should not be treated as evidence of the other.

Policy Enforcement and Conservation Practice

Policy enforcement received 55% agreement, the lowest of the three governance-related aspects examined in the household survey. This compares with 67% agreement for environmental awareness programmes and 65% for community participation. The qualitative findings also included concerns about the application and monitoring of wetland regulations and the institutional support available for wetland management.

Similar institutional concerns have been reported in other Kenyan wetland settings. Odero and Odenyo (2021) identified gaps in stakeholder involvement and planning processes in the management of Yala Wetland. Their subsequent work showed the importance of stronger participatory arrangements in improving community involvement in wetland management (Odero & Odenyo, 2022). These studies indicate that environmental regulations operate within institutional arrangements that also involve coordination, participation and implementation.

Evidence from Tanzania provides a related perspective. Mkonda (2022) identified institutional and stakeholder-related challenges in the sustainable management of Akagera Wetland. The study indicates that the existence of conservation policies and management structures does not by itself ensure that wetland-management measures are implemented effectively. Institutional capacity and the practical application of management arrangements remain important considerations.

In Masaba South, the comparatively lower rating of policy enforcement should therefore be interpreted as a less favourable assessment of this aspect of wetland management rather than as evidence that enforcement directly determined household behaviour. The qualitative accounts add context by identifying concerns about monitoring, consistency in the application of regulations and institutional support.

The findings indicate that environmental awareness, community participation and policy enforcement were not viewed equally by respondents. While awareness and participation received relatively stronger agreement, enforcement received a more mixed assessment. This difference points to an area of wetland management that may require greater institutional attention, while the cross-sectional evidence does not establish that enforcement conditions caused continued wetland use.

Support for Sustainable Wetland Management Practices

Respondents expressed strong support for the sustainable wetland-management practices examined in the study. Controlled farming, wetland restoration and community education each received 75% agreement, while alternative livelihoods received 72%. These findings indicate substantial willingness among respondents to support measures intended to improve wetland management. However, the percentages represent expressed support and should not be interpreted as evidence that the practices had already been adopted or implemented.



The strong support for controlled farming and wetland restoration is important in a setting where households use wetlands for cultivation and other livelihood needs. Support for these measures indicates recognition of the need to manage wetland use, but implementation may require households to adjust existing resource-use practices. Such adjustments may be difficult where access to land and other livelihood resources is limited.

Community education also received 75% agreement. This finding indicates continued support for environmental education, although the results of the present study show that awareness should not be considered independently of the conditions under which households make resource-use decisions. Education may strengthen knowledge and understanding, but households may still face practical difficulties in applying conservation measures.

The 72% support for alternative livelihoods is particularly relevant to the livelihood concerns reported in the qualitative findings. Kabumbuli and Kiwazi (2009) found that wetland management among poor wetland-dependent communities in Uganda needed to incorporate alternative livelihood opportunities alongside participatory planning. Maua et al. (2022) similarly documented the tension between wetland conservation and livelihood dependence in Kenya's Yala Swamp. More recent work by Nyumah and Brambilla (2025) also examined the challenge of balancing wetland habitat conservation with community livelihoods.

The findings from Masaba South therefore indicate that respondents were receptive to several approaches to sustainable wetland management. Turning this support into practice may, however, depend on the resources and institutional arrangements available to households. The results provide evidence of willingness to support the proposed measures, while their actual adoption and effectiveness would require further investigation.

Livelihood Dependence and Conservation Choices

The qualitative findings showed that wetland use in Masaba South was closely connected to household livelihood needs. Participants reported that some households depended on wetlands for cultivation and other daily needs, while poverty, land scarcity and limited livelihood alternatives restricted the options available to them. These circumstances are important when interpreting continued wetland use among communities that also expressed support for conservation.

A similar tension between conservation and livelihood dependence has been reported in other Kenyan wetlands. Maua et al. (2022) found that communities around Yala Swamp recognized the importance of wetland conservation while also depending on wetland resources for their livelihoods. Nasongo et al. (2015) likewise showed that access to and use of resources in the Nyando Papyrus Wetland were connected to livelihood interests and the institutional arrangements governing resource access. These studies provide useful context for understanding why conservation choices cannot be considered separately from household livelihood needs.

Evidence from elsewhere in Africa reinforces this interpretation. Kabumbuli and Kiwazi (2009) found that wetland management among poor wetland-dependent communities in Uganda needed to incorporate alternative livelihood opportunities. Nyumah and Brambilla (2025) similarly examined the challenge of balancing habitat conservation with community livelihoods. The common issue across these settings is that conservation measures operate within communities where natural resources also contribute to household welfare.

In Masaba South, the importance of livelihood options is supported by the finding that 72% of respondents agreed with the provision of alternative livelihoods as a wetland-management measure. This level of support does not establish that alternative livelihoods would automatically reduce wetland use, but it indicates that respondents considered livelihood options relevant to sustainable wetland management.

Continued dependence on wetlands should therefore not be interpreted simply as lack of environmental awareness or unwillingness to conserve. The findings indicate that conservation choices were made within circumstances that included access to land, household livelihood needs and available economic options.



Measures intended to reduce pressure on wetlands may consequently need to consider how households can meet their livelihood needs while participating in conservation.

Interpretation Using the Socio-Ecological Systems Framework

The Socio-Ecological Systems framework helps explain the findings from Masaba South by linking wetland resources, the people who depend on them and the institutions responsible for their management. Ostrom (2009) argues that the sustainability of natural resources depends on relationships among resource systems, resource users and governance arrangements.

In Masaba South, these relationships can be seen in the way environmental awareness, livelihood needs and governance conditions occurred together. Respondents generally supported wetland conservation, but some households continued to depend on wetlands for farming and other needs. At the same time, policy enforcement received lower agreement than awareness programmes and community participation. Wetland use therefore needs to be understood within both household livelihood conditions and the way wetland management is carried out.

This interpretation agrees with Tuji et al. (2024), who used an SES approach to examine the relationship between human activities, land-use change and wetland ecosystem services in Ethiopia. Their study shows that changes in wetland systems are closely connected to the activities and needs of the people who use them.

Okyere et al. (2026) also examined the relationship between natural resources, local livelihoods and multi-stakeholder governance in Ghana's Muni-Pomadze Ramsar Site. Their study is relevant to Masaba South because it places livelihoods and governance within the same resource-management setting rather than treating them as separate issues.

The SES framework therefore helps explain why environmental awareness alone may not be enough to change wetland-use practices. A household may know why wetlands should be protected but still depend on wetland land for farming. In the same way, community members may support conservation while facing limited institutional support or uneven enforcement of wetland rules.

For Masaba South, sustainable wetland management needs to consider the wetland, the people who use it and the institutions responsible for its management as connected parts of the same system. Changes in one part may affect the others. This provides a useful way of understanding the gap between knowing, being willing and being able to act.

Contribution of the Study

This study adds to wetland-management research by showing the importance of separating environmental awareness from the ability to put conservation practices into use. In Masaba South, respondents expressed positive views about environmental awareness programmes and community participation and showed strong support for several sustainable wetland-management practices. At the same time, participants reported weak policy enforcement, limited institutional support, poverty, land scarcity and limited alternative livelihoods.

The study therefore identifies three related but different conditions in community wetland management: knowing why wetlands should be conserved, being willing to support conservation, and being able to put conservation measures into practice. The findings indicate that these conditions may not always occur together. This distinction helps explain why environmental awareness may exist alongside continued dependence on wetland resources.

The study also adds evidence from a rural farming setting in western Kenya, where wetland conservation is closely connected to access to land and household livelihoods. It brings governance and livelihood conditions into the same explanation of the awareness-to-action gap rather than treating environmental knowledge as the main issue.



For wetland-management practice, the findings point to the need to combine environmental education and community participation with institutional support, consistent application of wetland regulations and practical livelihood options for wetland-dependent households.

CONCLUSION AND RECOMMENDATIONS

Conclusion

The study examined environmental awareness, community participation, governance and livelihood conditions in relation to sustainable wetland management in Masaba South Sub-County. Respondents generally had positive views of environmental awareness programmes and community participation, with agreement levels of 67% and 65%, respectively. Policy enforcement received a lower agreement level of 55%. Respondents also expressed strong support for controlled farming, wetland restoration and community education, each at 75%, while 72% supported alternative livelihoods.

The findings show that awareness and willingness to support conservation do not necessarily mean that households are able to put conservation measures into practice. Participants reported weak policy enforcement, limited institutional support, poverty, land scarcity and limited livelihood alternatives. For households that depend on wetlands for farming and other needs, these conditions may make changes in wetland use difficult.

The study concludes that sustainable wetland management in Masaba South requires more than environmental awareness. Community willingness needs to be supported by functioning institutions, consistent application of wetland regulations and practical livelihood options. Wetland management should therefore address conservation, governance and household livelihood needs together.

Recommendations

Wetland-management agencies and local authorities should strengthen the consistent application and monitoring of wetland regulations while maintaining community involvement in decisions about wetland use. Enforcement should be accompanied by clear information on permitted and restricted activities so that wetland users understand both the rules and their responsibilities.

Environmental education should continue, but programmes should move beyond creating awareness to helping communities put conservation practices into use. Training can focus on controlled farming, wetland restoration and other locally appropriate practices that respondents were willing to support.

Government agencies, development partners and community organizations should support practical livelihood options for households that depend heavily on wetlands. Such support should be suited to local conditions and should aim to reduce dependence on activities that place pressure on wetland resources without weakening household food and income security.

Community participation should include meaningful involvement in planning, implementation and monitoring rather than being limited to consultation or attendance at meetings. Local knowledge and the experiences of wetland users should be considered when wetland-management measures are developed and implemented.

Further research should examine changes in wetland-management practices over time and assess whether specific governance, education and livelihood interventions are associated with changes in household behaviour and wetland condition. Longitudinal or intervention-based studies would provide stronger evidence on relationships that could not be tested using the cross-sectional design of the present study.

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