Perceived Livelihood Consequences of Wetland Degradation in Masaba South Sub County, Kenya

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ABSTRACT

Wetlands support farming and household water needs, making their condition relevant to rural livelihood security. This paper examines household perceptions of livelihood consequences associated with wetland degradation in Masaba South Sub-County, Kisii County, Kenya. A descriptive cross-sectional household survey targeted an estimated population of 8,000 wetland users. Of 380 questionnaires administered, 352 were completed and returned, giving a response rate of 92.6%. Five-category agreement responses were summarized using descriptive percentages. Combined agreement was highest for reduced crop yields at 80%, followed by water scarcity at 76%, increased workload at 74% and increased poverty at 73%. The pattern places production, water access, household labour and economic hardship within the same account of perceived livelihood pressures. Water scarcity had the largest strongly agree share, while reduced crop yields had the highest combined agreement. These findings provide a basis for household consultation and coordinated assessment by agriculture, water and environmental services. The study contributes local evidence on livelihood concerns in small wetland settings, where conservation planning must account for the resources and work involved in meeting daily needs. Because the evidence is cross-sectional and based on perceptions, it does not establish the magnitude or causes of livelihood changes. Further research should link household production, water access, income and time-use records with environmental monitoring.

Keywords: wetland degradation; household livelihoods; crop yields; water scarcity; workload; Masaba South

1. INTRODUCTION

Wetlands form part of the resource base of rural households through their contribution to water access, farming and other daily activities. When wetland conditions deteriorate, the implications can extend beyond the ecosystem to the work and resources needed to maintain a household. The conservation and livelihood tension has been examined in Yala Swamp, Kenya, where wetland use and protection need to be considered together (Maua et al., 2022). Research in Uganda likewise places household needs within wetland planning and management (Kabumbuli & Kiwazi, 2009).

Across sub-Saharan Africa, wetland agriculture supports livelihoods alongside other uses of natural resources. Rebelo et al. (2010) found that household dependence varied between locations and socio-economic groups. Their findings caution against assuming that wetland deterioration has the same livelihood implications for every household. A local assessment should therefore consider who depends on which resources and what other options are available.

Livelihood consequences require careful measurement. Reduced production, difficulty obtaining water, economic hardship and additional work are related concerns, but they are not interchangeable. Agreement that wetland degradation reduces crop yields does not reveal how much production has fallen. A view that poverty has increased does not establish a change in household income against a defined poverty threshold. Survey perceptions can identify concerns for investigation while remaining distinct from measured changes in welfare.

Recent Kenyan research also shows why water access and household work deserve separate attention. Njoroge et al. (2024) assessed water insecurity through accessibility, affordability, sufficiency and safety, identifying

differences across household circumstances. In a rural Kenyan experiment, Cook et al. (2024) found that reducing water collection time changed how respondents allocated their time and improved reported happiness. These studies support examining livelihood concerns beyond income alone.

In Masaba South, the household consequences of wetland deterioration deserve attention alongside conservation programmes. The research question is how wetland users assess four livelihood consequences: reduced crop yields, water scarcity, increased poverty and increased workload. The study brings these concerns together to identify priorities for local planning. Its contribution is a focused account of perceived livelihood pressures in a small wetland setting, connecting production and economic concerns with water access and daily work.

This article draws on the household survey used in Nyarira et al. (2026). While that publication examined conservation strategies and management preferences, the present article examines household perceptions of livelihood consequences associated with wetland degradation.

2. LITERATURE AND CONCEPTUAL PERSPECTIVE

Wetland livelihoods involve access to resources as well as the capacity to use them. Nasongo et al. (2015) examined access and resource use within multiple institutional arrangements in Kenya's Nyando Papyrus Wetland. Their work helps place livelihood questions within the wider setting of resource access. Maua et al. (2022) consider the difficulty of balancing wetland conservation and use, while Kabumbuli and Kiwazi (2009) connect participatory management with livelihood alternatives. These studies provide context for examining household welfare alongside wetland condition, without assuming that findings from one wetland apply directly to another.

Research in western Ethiopia illustrates the tension between immediate agricultural benefits and maintaining wetland functions. Dixon and Wood (2003) examined cultivation and hydrological management, emphasizing local arrangements that accommodate several wetland uses. This provides a reason to investigate how farming and water needs can be met while retaining other benefits. It does not establish that all wetland cultivation is equally damaging or that the same management approach will suit Masaba South.

Ostrom's (2009) Social-Ecological Systems framework guides the discussion. Wetlands are the resource setting, households are users, and farming and water access are activities through which people depend on that setting. The four survey items describe respondents' views of possible livelihood consequences. The framework helps organize these concerns, but the survey does not test the relationships among ecological condition, resource use and household welfare.

Tuji et al. (2024) applied the Social-Ecological Systems framework to Boyo Wetland in Ethiopia using household surveys, focus groups and stakeholder analysis. Their study considered resource use alongside actors and governance. It illustrates how the framework can guide the collection of evidence on connected dimensions of wetland use. The present analysis covers a narrower set of household perceptions and does not reproduce that wider assessment.

The distinction between a consequence and a constraint is central to this paper. Poverty may limit a household's choices about resource use, while respondents may also regard it as a consequence of environmental deterioration. The present analysis examines agreement with the latter proposition. It cannot determine the direction of influence or establish whether declining livelihoods lead to greater wetland use.

3. METHODOLOGY

3.1 Setting and design

The study was undertaken in Masaba South Sub-County, Kisii County, Kenya, where wetland resources support farming and household activities. It formed part of a wider descriptive cross-sectional study with a 2024–2025 scope. Household questionnaires were administered face to face. The present analysis uses the

quantitative livelihood items; interviews, focus group discussions and observations from the wider study are outside its analytical scope.

3.2 Population and sampling

The estimated target population was 8,000 small-scale farmers or household heads engaged in wetland-related activities. The planned sample was approximately 384 respondents, determined using Cochran's (1977) approach with p = .50. A total of 380 questionnaires were administered and 352 were completed and returned. The response rate was 92.6% of questionnaires administered, with 28 not returned. The achieved sample was 91.7% of the planned sample.

Villages and zones with active wetland use were identified, and an ordered list of eligible households in wetland-adjacent areas was prepared. Households were selected systematically after a random starting point. The available sampling documentation does not specify the numerical interval or allocation across villages.

3.3 Measures and instrument review

The household questionnaire included four agreement items on livelihood consequences associated with wetland degradation: reduced crop yields, water scarcity, increased poverty and increased workload. Responses used five categories: strongly agree, agree, neutral, disagree and strongly disagree. Each item was analysed separately, preserving the distinction between production, water access, economic hardship and labour.

The questionnaire underwent specialist review and a pilot involving 10 respondents at Tente Wetland in Nyamira County, outside the main study area. Feedback informed changes to wording and question order. The four livelihood items were not combined into a scale. Internal consistency across a whole questionnaire does not establish the reliability of a separate group of items (Tavakol & Dennick, 2011).

3.4 Analysis and interpretation

Survey data were coded and analysed using SPSS. The present analysis uses the whole-number percentages retained in the study's summary results. Combined agreement is the sum of strongly agree and agree; combined disagreement is the sum of disagree and strongly disagree. Frequencies were not reconstructed from rounded percentages. The achieved survey sample was 352; item-specific valid response counts were not available in the summary results.

Differences between items are descriptive comparisons. No significance tests, correlations or household-level relationships are reported. The percentages cannot establish that wetland degradation caused the stated livelihood consequences or that the same households experienced all four concerns.

3.5 Ethical considerations

Ethical approval was obtained from Kisii University ISERC and a research permit from NACOSTI. Participants gave informed consent before data collection. Results are presented in aggregate to protect household confidentiality.

4. RESULTS

4.1 Views on livelihood consequences

Combined agreement exceeded 70% for each livelihood item. Reduced crop yields received the highest agreement at 80%. Water scarcity followed at 76%, increased workload at 74% and increased poverty at 73%. Table 1 presents the complete distributions, including neutral and negative responses.

Table 1 Household perceptions of livelihood consequences of wetland degradation

Consequence	Strongly agree %	Agree %	Neutral %	Disagree %	Strongly disagree %	Combined agreement %
Reduced crop yields	44	36	8	7	5	80
Water scarcity	46	30	10	8	6	76
Increased poverty	38	35	12	9	6	73
Increased workload	40	34	10	8	8	74

Note. Source: household survey. Achieved sample: 352. Values are whole percentages. Combined agreement = strongly agree + agree. Item-specific valid response counts were not available in the summary results.

4.2 Production and water concerns

For reduced crop yields, 44% strongly agreed and 36% agreed, giving combined agreement of 80%. Eight percent were neutral and 12% disagreed or strongly disagreed. This was the most widely endorsed livelihood consequence.

Water scarcity received 46% strong agreement and 30% agreement. Ten percent were neutral and 14% disagreed or strongly disagreed. Although reduced crop yields had higher combined agreement, water scarcity had the largest strongly agree share among the four items. This distinction shows that the ordering of concerns depends partly on whether overall endorsement or the strongest response category is considered.

4.3 Economic hardship and workload

Increased poverty received 38% strong agreement and 35% agreement, giving combined agreement of 73%. Twelve percent were neutral, the largest neutral share among the items, and 15% disagreed or strongly disagreed. Most respondents endorsed the poverty item, while just over one-quarter were neutral or disagreed.

For increased workload, 40% strongly agreed and 34% agreed. Ten percent were neutral and 16% disagreed or strongly disagreed. Workload had the highest combined disagreement among the four items, alongside a substantial majority expressing agreement. The seven-percentage-point range in combined agreement across all items indicates broad endorsement of several livelihood concerns rather than support concentrated on a single consequence.

5 DISCUSSION

5.1 Implications for household production and water access

The results place crop production and water access among the main concerns for follow-up assessment. The importance respondents attached to reduced yields warrants attention to production records, crop types and seasonal conditions. Water scarcity warrants examination of source reliability, access and household demand. These are complementary assessment priorities, but the response distributions alone do not show that water shortages explain the yield concern.

Dixon and Wood (2003) show why production concerns should be examined alongside hydrological management: cultivation can support immediate food needs while raising questions about the persistence of wetland benefits. In Masaba South, the crop-yield and water-scarcity responses identify concerns consistent with this management problem. They do not establish that drainage, cultivation or any particular practice caused either reported consequence. Farm and water records are needed to examine those explanations.

The findings fit a broader wetland literature that considers livelihood needs alongside ecosystem protection (Maua et al., 2022; Kabumbuli & Kiwazi, 2009). The contribution here is a descriptive account of four

livelihood perceptions in Masaba South. The evidence is strongest as an indication of what respondents considered concerning, rather than a measurement of agricultural or hydrological change.

The broad water-scarcity item also leaves important differences unresolved. Njoroge et al. (2024) show that water insecurity can involve affordability and sufficiency as well as physical access and safety. Their national analysis used 2015/16 household data, so its estimates are not a measure of present conditions in Masaba South. Its measurement approach nevertheless suggests useful follow-up questions on water costs, quantities, reliability and collection time.

5.2 Economic hardship and the demands of daily work

The poverty item draws attention to perceived economic consequences, but its broad wording leaves several questions open. Income, expenditure, assets and food consumption may change in different ways. A household can face greater costs without crossing a poverty threshold, and low income may have causes unrelated to wetlands. Follow-up assessment should identify the particular economic changes respondents meant before selecting a support measure.

Rebelo et al. (2010) found variation in wetland dependence across socio-economic groups. This suggests that an overall agreement percentage may conceal different experiences among households with different resources. The Masaba South table cannot identify which households face the greatest hardship or whether poorer households depend more heavily on wetlands. Those questions require household-level comparisons rather than an inference from the aggregate poverty response.

The workload finding adds a dimension that income figures alone would miss. Further enquiry should establish whether respondents mean additional farming work, water collection, resource gathering or another activity. Time-use records would help determine who performs the work and whether it displaces education, rest or paid activities. The present item does not support attributing the burden to women, children or any other group.

Cook et al. (2024) provide a useful comparison for interpreting time burdens. In their short intervention, time saved from water collection was used for other household work and leisure or social activity, without evidence of increased paid work or on-farm labour. This cautions against treating additional work as an income loss that can be calculated directly from hours. The Masaba South survey did not record work time or identify the tasks involved, so it cannot estimate such effects. Follow-up research could record tasks and time use alongside household well-being.

5.3 Implications for livelihood planning

The practical value of the findings lies in bringing household concerns into the design of local assessment and support. A response centred only on crop production could overlook water access and the work needed to secure household resources. A response centred only on income could miss time pressures that affect daily welfare. The survey supports considering these dimensions together, while leaving the choice of interventions to a more detailed assessment of household circumstances.

The Social-Ecological Systems framework provides a way to organize this assessment around resources, users and management arrangements (Ostrom, 2009). Nasongo et al. (2015) show why access to wetland resources must be understood within institutional arrangements. Applied to Masaba South, this suggests asking which resources households use, how access is arranged and how proposed changes would affect daily needs. The present results identify concerns for those discussions; the relationships among the four concerns remain questions for further research.

County agriculture, water and environmental officers could begin with a joint household assessment, developed with wetland users. Agricultural questions should identify the crops involved, production trends and conditions on farms. Water questions should establish source reliability, collection time, quantities and costs. Household welfare questions should distinguish changes in income and expenditure from changes in work.

Recording these issues for the same households would support more precise decisions about where assistance is needed.

Household consultation should also establish who might bear the costs of proposed conservation measures. The livelihood tensions described by Maua et al. (2022) and Kabumbuli and Kiwazi (2009) make it useful to assess alternative activities before expecting households to reduce resource use. In Masaba South, this means examining available land, skills, labour and market access. These are planning recommendations informed by the survey concerns and the literature, rather than interventions whose effectiveness was tested in this study.

5.4 Limitations

This study used self-reported responses collected at one point in time. The findings describe perceptions rather than measured changes in crop yields, income, water availability or working hours. Recall and socially desirable responses may have influenced the answers, and non-respondents may have held different views. Summary percentages did not permit household-level comparisons or verification of item-specific counts. Exact fieldwork dates and detailed sampling allocation were not available in the study documentation. The descriptive analysis cannot establish causation or changes over time.

6 CONCLUSION AND RECOMMENDATIONS

Household respondents in Masaba South expressed substantial agreement that wetland degradation had livelihood consequences. Reduced crop yields received 80% combined agreement, water scarcity 76%, increased workload 74% and increased poverty 73%. These figures identify perceived concerns rather than the magnitude or verified causes of livelihood losses.

County agriculture, water and environmental officers should use the findings to guide household consultation and assessment. Agricultural follow-up should examine crop production and farm conditions. Water assessments should record source reliability, access and seasonal shortages. Livelihood assessments should include household costs and time spent on daily tasks, alongside income. Proposed support should respond to identified needs and be assessed for its environmental implications.

Further research should collect repeated household and environmental measurements, using clear reference periods. Production records, water-access measures, time-use information and income or expenditure data would permit a more precise account of livelihood change. Linking these measures for the same households would help test relationships that the present descriptive responses cannot establish.

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