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Research article

CONSERVATION WITHOUT ADEQUATE COMPENSATION AND GENDERED LIVELIHOOD ADJUSTMENT IN THE OBAN SUPPORT ZONE OF CROSS RIVER NATIONAL PARK NIGERIA

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ABSTRACT

This study re-examines gendered access to compensation and livelihood adjustment in Oban Division support-zone communities adjoining Cross River National Park, Nigeria. Questionnaire and participatory rural appraisal evidence from 360 respondents in Ifumkpa, Old Netim, Oban and Aking was reconstructed into auditable descriptive tables. Reported inferential outputs were retained only where their variables could be identified, and inconsistencies were disclosed. Results show limited access to compensatory benefits: only four male respondents were recorded as receiving employment, while no respondent was recorded as receiving credit, crop-loss compensation or skills training. Livelihood profiles indicate gender specialisation, with women concentrated in farming and non-timber forest-product collection and men concentrated in timber-related activity. After park establishment, 126 male respondents were recorded as having stopped their former activity, whereas 181 female respondents reported limitations rather than complete cessation. Only 18 of 360 respondents described income as adequate. Implications: Conservation policy requires gender-responsive benefit access, eligibility, non-forest enterprises, market support and participation in resource governance. The study distinguishes documented access, perceived livelihood changes and causal attribution, supporting equitable protected-area management without claiming that the cross-sectional archive isolates park effects from wider economic change.

KEYWORDS

protected areas; gendered livelihoods; compensation access; support-zone communities; non-timber forest products; Cross River National Park; conservation governance; livelihood diversification

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Introduction

Protected areas are established to conserve biodiversity, ecological processes and landscapes of public value. Their effectiveness, however, depends partly on the legitimacy of rules among people whose livelihoods are linked to the protected landscape. Where access restrictions remove or reduce farming, timber, hunting or non-timber forest-product opportunities, conservation can transfer costs to nearby households. Compensation, alternative livelihoods and participation are therefore not optional public-relations measures; they are mechanisms for reducing uncompensated loss, supporting compliance and aligning social welfare with conservation objectives.

The Cross River National Park contains some of Nigeria's most important remaining tropical forest. The Oban Division is surrounded by support-zone communities whose residents use land and forest resources for food, income, construction materials and trade. The study examined women in Aking, Ifumkpa, Oban and Old Netim and compared access to park benefits, livelihood activity and income before and after park establishment. The study's gender focus is justified because women were strongly represented in farming and non-timber forest-product collection, while customary and institutional arrangements could limit their access to land, formal employment and credit.

The also shows why gender analysis must be more precise than a general statement that women are vulnerable. Men and women occupied different livelihood niches, and restrictions could affect them differently. Men were more heavily

represented in timber-related activities, while women were concentrated in farming and non-timber forest products. Complete cessation of an activity and continuing under limitation are distinct outcomes. A gender-responsive interpretation should therefore compare exposure, degree of disruption, access to support and household interdependence rather than assume a single uniform effect.

This article reanalyses the evidence using defensible terminology. A reported change after park establishment is described as a temporal comparison or perceived livelihood adjustment, not as proof that the park alone caused the change. Recorded access means the survey documented a benefit; it does not establish the quality, value or duration of that benefit. Income adequacy is a respondent assessment rather than an independently verified poverty measure. These distinctions allow strong conclusions about gaps in the recorded support system while avoiding causal overstatement.

The objectives are to reconstruct the sample and livelihood profile, assess recorded access to compensation and employment, compare reported activity status after park establishment, examine perceived income adequacy and identify preferred interventions. The article then develops implications for conservation finance, benefit administration, livelihood diversification and gender-responsive governance. Its contribution lies in converting an older field archive into an auditable policy baseline without erasing internal inconsistencies.

Literature review

Protected-area scholarship has moved from fortress conservation towards models that recognise rights, wellbeing and local knowledge. Oldekop et al. (2016) found that protected areas with positive socio-economic outcomes were more likely also to report positive conservation outcomes, although association does not mean every benefit intervention produces ecological success. Bennett and Dearden (2014) similarly show that community perceptions of livelihood and governance effects influence support for conservation. These findings are directly relevant to support zones because rules are experienced through everyday access, opportunity and administrative treatment (Eneyo et al., 2022).

Compensation can take monetary and non-monetary forms, including crop-loss payments, employment, training, credit, infrastructure and preferential access to enterprise opportunities. The effectiveness of compensation depends on eligibility, valuation, timeliness, accessibility and transparency. A programme may exist formally while intended beneficiaries cannot navigate procedures or do not qualify under documentation rules. The survey asked about specific benefits, creating a useful administrative-access test. It did not measure application rates, rejected claims or benefit value, so explanations for low access remain to be investigated.

Gendered livelihood analysis requires attention to the division of labour and control over assets. Women's contributions to farming, processing and non-timber forest products may be economically significant but undercounted because they combine subsistence, household and market functions. Men may dominate timber or wage work that yields larger cash returns but is more directly restricted. The result is not a hierarchy of suffering. It is a pattern of differentiated exposure in which household outcomes are produced jointly by gendered activities, bargaining power and access to replacement opportunities (Agbor et al., 2026; Eneyo et al., 2026; Onnoghen, 2026a, 2026b; Onnoghen, Inyang, et al., 2025; Onnoghen, Unimtiang, Nwagbara, et al., 2024; Unimtiang, Onnoghen, Efut, et al., 2025).

Community participation is often assessed by attendance at meetings, yet meaningful participation includes influence over rules, representation, grievance resolution and benefit allocation. Park agencies may consult community leaders without reaching women, younger people or occupational groups most affected by restrictions. The literature on collaboration in protected areas argues that governance arrangements and power relations shape sustainability. A gender-responsive institution therefore needs disaggregated records not only of beneficiaries but also applicants, decision makers and appeals (Ogbaji et al., 2025; Onnoghen, Unimtiang, Onnoghen, et al., 2024; Unimtiang, Onnoghen, Ogbaji, et al., 2025).

The relationship between conservation and livelihoods is dynamic. Households may shift from forest-based activity to farming, petty trade, wage labour, migration or combinations of activities. Such adaptation can reduce direct pressure on protected resources, but it may also produce new environmental pressures outside the park or deepen insecurity if replacement income is unstable. Sustainable livelihood policy should assess assets, capabilities, market demand and risk rather than provide training without equipment, credit or buyers (Igelle et al., 2023; Inah et al., 2022; Onnoghen, Adeniyi, et al., 2024; Onnoghen, Anabaraonye, et al., 2024; Onnoghen, Anabaraonye, Owoh, et al., 2025; Onnoghen, Nwobu, et al., 2024; Onnoghen, Olisah, et al., 2024; Onnoghen, Onwuzurike, & Anabaraonye, 2025; Onnoghen, Unachukwu, et al., 2024).

Eneyo et al. (2026) document conservation constraints and livelihood transitions among riverine women in the Cross River Basin, reinforcing the regional relevance of gendered environmental change. Eneyo (2025) emphasises that environmental management must integrate ecological protection with human systems, while Eneyo's tourism texts identify community benefit and service organisation as conditions for sustainable visitor development. These related works support an integrated interpretation of the park as both a conservation landscape and a potential ecotourism economy.

Nature-based tourism is frequently proposed as an alternative livelihood, but visitor enterprise is not automatically inclusive. Tourism opportunities require access to sites, skills, finance, transport, marketing, safety and a sufficient visitor market. Women may be included in craft or catering roles while excluded from guiding, contracts or decision-making. Any ecotourism intervention should therefore specify the product, expected demand, benefit rules and environmental safeguards. The present archive does not measure tourism demand, so tourism is considered a possible diversification pathway rather than a demonstrated solution (Eneyo & Ekpenyong, 2018; Eyo et al., 2026; Onnoghen, Kujoh, et al., 2025; Onnoghen, Sylvanus, et al., 2023).

A central literature gap is the limited separation of programme availability from effective access. Published policies may list loans, compensation and training, while household surveys reveal almost no receipt. The difference can arise from inadequate funding, poor communication, eligibility barriers, administrative delay, elite capture or programme discontinuity. This article treats the access table as an outcome requiring institutional explanation, not as proof of a single cause. The distinction is important for designing reforms that respond to the actual failure point.

Conceptual and analytical framework

The framework links conservation restriction, livelihood exposure, benefit access, adaptive response and conservation legitimacy. Restriction changes the set of permissible activities. Exposure depends on the household's prior livelihood portfolio and rights. Benefit access may offset loss or support a transition. Adaptive response can involve continuation under limitation, complete cessation, substitution or diversification. Legitimacy is influenced by whether rules and benefits are perceived as fair, predictable and responsive. The archive provides evidence for exposure, access and reported response, but not a direct ecological measure of compliance.

Gender is treated as a structuring relation rather than a binary explanatory variable. The analysis asks which activities were associated with men and women, which benefits were recorded, and how outcomes differed. It avoids inferring that gender alone caused every difference because age, education, land rights, household position and community location may also matter. Without the individual dataset, these factors cannot be modelled. The descriptive reconstruction is therefore the strongest reproducible analysis available.

Methodology

The study used a mixed-method design combining questionnaires and participatory rural appraisal. Four Oban support-zone communities were included: Ifumkpa, Old Netim, Oban and Aking. The reconstructed sample comprises 360 respondents distributed as 83, 145, 96 and 36 respectively. The source presented men and women in its tables, although some totals varied across sections. The article uses the most internally complete tables for each analysis and flags denominator differences instead of forcing incompatible values into one synthetic dataset.

Questionnaire evidence covered background characteristics, livelihood activities, access to compensatory measures, reported activity change, income adequacy and preferred interventions. Participatory rural appraisal provided contextual information about resource use and community priorities. Because verbatim transcripts and coding records were not available, qualitative evidence is used only to clarify the setting and not presented as a separately reproducible thematic analysis.

The main descriptive indicators were benefit receipt, livelihood count by gender, post-establishment status, income adequacy and intervention preference. Percentages were recalculated from displayed counts where possible. Activity categories were interpreted cautiously because respondents could have multiple livelihood roles, and some source tables appear to treat the principal activity differently from all activities. The article does not combine mutually inconsistent tables or present percentages beyond the precision supported by the archive.

The report included chi-square or other significance statements for benefit access, activity change and income. Some outputs lacked a transparent contingency table or used totals that did not align with adjacent tables. Inferential findings are

therefore described only when the tested variables can be identified, and the policy conclusion does not rely on them. The observed access gap is large enough to be substantively important without an inferential test: no respondent was recorded as receiving credit, crop-loss compensation or skills training.

Reproducibility is supported through explicit reconstruction rules. Community totals are reported separately. The livelihood table uses 179 male and 181 female records from the activity distribution. The status table reports limited, stopped and improved categories as displayed. The income table uses the full sample of 360. Intervention priorities are ranked by the number of respondents selecting each option. Researchers with the archive can reproduce the percentages by dividing counts by the stated table denominator.

The analysis has several limitations. The fieldwork is historical and does not describe current programme access. Before-and-after responses are retrospective and may be affected by recall. The design lacks an unaffected comparison group, so wider market, policy and environmental changes cannot be separated from park establishment. Income adequacy is subjective, and the archive does not report monetary income consistently. Finally, gender categories do not capture variation within women or men. These constraints narrow causal interpretation but do not erase the documented administrative-access problem.

Results and discussion

The sample was concentrated in Old Netim and Oban, with smaller contributions from Ifumkpa and Aking. Community size in the sample should not be treated as a population weight because the selection process and community populations were not documented in sufficient detail. Nevertheless, the four-community coverage shows that the recorded patterns were not based on a single settlement. Differences among communities could not be tested because benefit and livelihood results were mainly presented in pooled form.

Table 1. Reconstructed community sample

Community	Respondents	Share (%)
Ifumkpa	83	23
Old Netim	145	40
Oban	96	27
Aking	36	10
Total	360	100

Recorded access to park-related benefits was extremely limited. Only four male respondents were shown as obtaining employment. No male or female respondent was recorded as receiving credit or loans, crop-loss compensation or workshop and skills training. This is the clearest finding in the archive because the displayed counts are unambiguous. It establishes an access deficit within the sample; it does not by itself identify whether programmes were absent, underfunded, inaccessible or unknown.

Table 2. Recorded access to compensatory measures

Benefit	Men	Women	Total recorded recipients
Employment	4	0	4
Credit/loan	0	0	0
Crop-loss compensation	0	0	0
Workshop/skills training	0	0	0

Note. Receipt was recorded in the survey; programme availability and applications were not documented.

The employment result also requires scale awareness. Four recipients among 360 respondents cannot plausibly offset widespread livelihood adjustment, even if the positions were stable and well paid. The archive did not describe job type, duration or selection criteria. Employment should therefore be reported as recorded receipt, not as adequate compensation. An administrative audit should compare programme budgets, applications, approval, gender, community, benefit value and payment date.

The livelihood distribution shows strong gender differentiation. In the reconstructed table, men were concentrated in timber-related activities, with 126 records, while women were concentrated in farming, with 143 records, and non-timber forest-product collection, with 38. Men also appeared in farming and non-timber forest products but at lower counts. This pattern supports differentiated analysis because restrictions on timber, farmland and collection routes do not create identical adjustment pathways.

Table 3. Principal livelihood activity by gender

Activity	Men	Women	Total
Farming	27	143	170
Non-timber forest products	13	38	51
Timber-related activity	126	0	126
Other/non-forest	13	0	13
Total records	179	181	360

Gender specialisation should not be interpreted as rigid exclusivity. Household livelihoods are often combined, seasonal and cooperative. Women may participate in processing and marketing timber-derived products, while men may contribute to farming and collection. The source categories simplify this complexity. Their value lies in identifying the principal exposure recorded by the study. Future surveys should allow multiple responses, time allocation and control over income so that activity and benefit are not reduced to one occupational label.

Study post-establishment status differed by gender. The table recorded 126 men as having stopped their former activity and 53 men as limited, while 181 women were recorded as limited and none as stopped in that particular status summary. This indicates that the most visible complete cessation was concentrated among men in timber-related work, whereas women's farming and collection continued under constraint. It does not mean women were unaffected; limitation can reduce quantity, time efficiency, product quality or income.

Table 4. Activity status after park establishment

Status	Men	Women	Total
Activity limited	53	181	234
Activity stopped	126	0	126
Activity improved	0	0	0
Total	179	181	360

Note. A separate change/no-change table is discussed in text because its categories are not identical.

Another source table divided respondents into changed and unchanged activity, with 140 men and two women classified as changed and 41 men and 177 women classified as unchanged. The figures are broadly compatible with differentiated disruption but not identical to the limited/stopped table.

Income adequacy was poor across the sample. Only 18 respondents described income as adequate, 299 described it as inadequate and 43 were undecided. The 83.1% inadequate share is a respondent assessment of sufficiency and cannot be converted directly into a poverty rate. It nevertheless shows that the livelihood and support system was not perceived as producing adequate income for most participants. This result is consistent with the near absence of recorded compensatory benefits.

The archive also reported that a large proportion of women considered new income inadequate, but exact gender-specific denominators varied. The present article therefore uses the full-sample income table as the primary result. Gender-disaggregated income remains a priority for new research because women's earnings may be smaller, less regular or combined with unpaid care work. Monetary value, seasonality and control over spending should be recorded separately.

Table 5. Income adequacy and preferred policy responses

Indicator	Response	n	% of 360
Income adequacy	Adequate	18	5.0
	Inadequate	299	83.1

	Undecided	43	11.9
Preferred intervention	Water provision	360	100.0
	Modify/lift timber restriction	319	88.6
	Forest access arrangement	301	83.6
	Market provision	288	80.0

Note. Intervention options may be multiple-response selections.

Preferred interventions reveal that respondents did not focus only on direct cash. Water provision was selected by all 360 respondents in the ranked table, while lifting or modifying the timber ban, forest access and market provision also received high support. These priorities combine basic infrastructure, resource rights and economic access. They suggest that compensation should be understood broadly, but they do not automatically establish that every requested intervention is ecologically feasible.

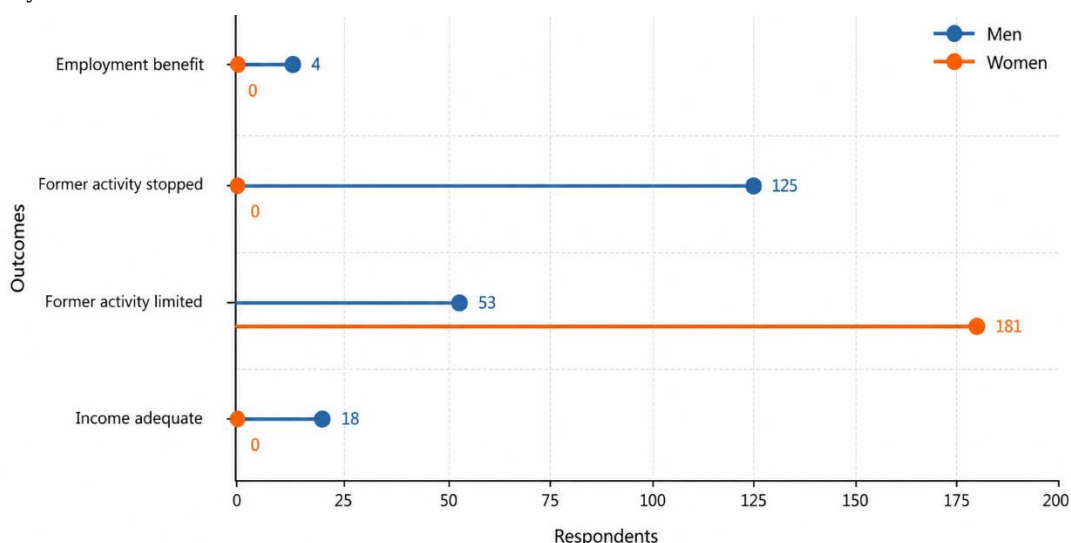


Figure 1. Gender-differentiated livelihood status recorded after park establishment

Source: Reconstructed from the support-zone survey (n = 360).

Calls for renewed forest or timber access require a negotiated conservation assessment. Unrestricted access could undermine park objectives, while blanket exclusion without credible alternatives can weaken legitimacy and encourage informal use. Co-management, zoned access, community forestry outside core conservation areas and monitored non-timber harvesting are possible options. Their appropriateness depends on ecological data, tenure and enforcement capacity, none of which were tested by the livelihood survey.

Market access is a particularly important complement to skills and credit. Training people to produce goods without buyers may create no sustainable income. Non-forest enterprises should be selected after market assessment, with attention to start-up cost, seasonality, transport, competition and household labour. Women should be able to choose higher-value roles rather than being channelled automatically into stereotyped low-return activities. Programme monitoring should report survival and income after at least one full production cycle.

The zero counts for credit and training indicate either programme failure or a major disconnect between programmes and sampled respondents. A benefit programme can fail through limited funds, centralised application, collateral requirements, low literacy, information gaps or capture by intermediaries. Each mechanism requires a different response. Publishing only a total allocation would not show accessibility. A case-level register with protected personal data would allow the park service to monitor reach and investigate exclusion.

The findings align with broader evidence that social outcomes and conservation outcomes are interconnected. Oldekop et al. (2016) do not imply that benefits guarantee conservation, but they show why wellbeing should be treated as part of effectiveness. In Oban, a support-zone concept without visible support risks becoming administrative language rather than

a functioning relationship. Recorded benefit access is therefore a governance performance indicator, not only a welfare indicator.

The study's conclusion sometimes framed men as more displaced because timber activities stopped, while women were described as negatively affected through limited farming and collection. The reconstructed evidence supports differentiated impacts but not a single ranking of severity. Complete occupational cessation, reduced access, income insufficiency and unpaid workload are measured on different scales. A defensible gender conclusion is that men and women experienced distinct forms of adjustment and both require tailored support.

Conservation and household welfare are also linked through intra-household effects. Loss of a male cash activity can reduce resources available to women and children, while restrictions on women's food and non-timber activities can increase food insecurity and care burden. Individual-level benefit records may therefore underestimate household consequences. Future evaluation should collect household composition, joint income sources, food security and decision-making alongside individual occupation.

The archive does not measure illegal activity or conservation attitudes after benefit denial. It would be inappropriate to infer that respondent violated rules. Nevertheless, governance theory suggests that perceived unfairness can reduce cooperation. A grievance mechanism should allow residents to ask about eligibility, appeal decisions and report programme problems without fear. Records of complaints and resolution times would provide an institutional indicator that is currently absent.

The strongest combined interpretation is that compensatory access was insufficient relative to the scale and diversity of reported livelihood adjustment. This conclusion is supported by near-zero receipt, widespread income inadequacy and strong demand for infrastructure, markets and access. It does not depend on an uncertain significance test. Nor does it claim the park caused every economic problem. It identifies a support-zone system that, as documented, was not delivering a broad package of benefits to the sample.

Policy implications

The Park service should establish a transparent benefit-access register containing programme type, eligibility, application, decision, value, payment and community, with gender-disaggregated reporting. Public summaries should protect identities while showing reach. Zero or low uptake should trigger an investigation of whether the problem is funding, awareness, eligibility or administration. This is more informative than announcing that a compensation scheme exists.

Livelihood support should be built as a portfolio. Options may include climate-resilient agriculture outside restricted areas, value addition for legally sourced non-timber products, nurseries, agroforestry, restoration employment, tourism services and market-linked microenterprise. Each option requires environmental screening and a business pathway. Training alone is not an outcome; programmes should track enterprise start-up, income stability and household benefit.

Gender-responsive design requires separate consultations at times and locations accessible to women, representation in decision bodies and removal of documentation or collateral barriers that have unequal effects. It also requires attention to men's displaced timber livelihoods and the household consequences of lost cash income. Gender policy should not become a women-only add-on; it should identify differentiated roles, rights and effects across the livelihood system.

Resource-access requests should be addressed through participatory zoning and ecological evidence. Core conservation areas may require strict protection, while buffer areas, community forests or restoration zones may allow controlled use. Harvest rules need species, season, quantity and monitoring provisions. Agreements should be understandable, locally legitimate and enforceable. This approach is more defensible than either unrestricted access or rules that residents experience as arbitrary.

Monitoring should integrate social and ecological indicators. Social measures include benefit access, income adequacy, food security, grievance resolution and representation. Ecological measures include forest-cover change, illegal extraction indicators, fire, species condition and restoration survival. Joint review can reveal whether livelihood interventions reduce pressure or simply relocate it. The results provide a historical social baseline but require current data before programme targets are set.

Conclusion

The evidence supports a strong but bounded conclusion: compensation and alternative-support access recorded among the 360 respondents was extremely limited, while livelihood adjustment and income inadequacy were widespread. Men and women experienced different patterns, with complete cessation concentrated in male timber-related work and continuing limitation concentrated in women's farming and non-timber forest-product activities. These patterns should not be collapsed into a simple claim that one gender suffered more.

Sustainable management of Cross River National Park requires a support-zone system that is visible in household experience, not only in policy documents. Transparent eligibility, gender-responsive access, market-linked diversification, grievance resolution and participatory resource governance are practical priorities. Because the data are historical and cross-sectional, current implementation should begin with a new audit. The findings remain valuable as evidence of the gap that policy must demonstrate it has closed.

Analytical scope and robustness

The age of the archive requires a clear temporal boundary. The results describe conditions documented at the time of the fieldwork, not the present operation of Cross River National Park. Programmes may have changed; communities may have diversified and environmental pressures may have intensified. Policy makers should therefore use the article to identify questions for a current audit rather than assume that every zero count persists. Historical evidence remains valuable because it records an implementation gap against which later performance can be compared.

A current audit should begin by reconstructing the programme theory. For each intervention, the park service should state the problem addressed, target group, eligibility rule, delivery partner, budget, expected output and intended livelihood or conservation outcome. This would show whether employment was designed as compensation, whether credit was intended for individuals or groups, and whether training had an enterprise pathway. Without a programme theory, low access can be documented but not attributed to a precise administrative failure.

Benefit valuation should include more than the number of recipients. A single permanent job may have greater household value than a short workshop, while a delayed crop-loss payment may fail to protect consumption when the loss occurs. Records should include monetary value, duration, timing and recipient assessment. They should also identify whether benefits are additional or replace services that citizens should ordinarily receive. Water provision, for example, is a major community priority but should not be presented automatically as compensation for restricted resource rights.

The distinction between compensation and development is policy relevant. Compensation responds to a defined loss or burden and should be proportionate, timely and accessible to those affected. Community development provides broader infrastructure or opportunity and may benefit households regardless of direct loss. Alternative livelihood programmes seek to reduce dependence on restricted resources. Combining these under one label can obscure whether an affected household received redress. A monitoring framework should therefore report the three categories separately while recognising that they may reinforce one another.

Gender-disaggregated counts are necessary but insufficient. Women may be formally listed as beneficiaries while men control the asset or income, and a household programme may be registered to a male head despite women's labour. Future evaluation should ask who applied, who decided, who received the resource, who performed the work and who controlled proceeds. These questions reveal the pathway through which a nominally inclusive programme can produce unequal outcomes. They also prevent programme success from being inferred only from the sex of the person named on a register.

Education and documentation can affect access to formal programmes. The source described lower higher-education participation among women, but the data do not establish that education caused benefit exclusion. Programme design should nevertheless use plain-language information, local-language support, assisted application and alternatives to collateral or formal title where legally possible. These are universal-access measures that can improve reach without assuming beneficiaries lack capacity. Administrative simplicity should be balanced with safeguards against fraud and elite capture.

Participatory rural appraisal is useful for mapping seasonal calendars, resource routes, gender roles and priorities, but its outputs need systematic documentation. Future work should report group composition, facilitation process, prompts, maps or matrices produced, and how disagreements were recorded. Separate sessions may be necessary where social norms inhibit women or younger participants from speaking. Triangulation should compare group accounts with household

surveys, administrative records and ecological observations rather than treat consensus in a workshop as representative of every resident.

Livelihood diversification should not be assessed only by the number of new activities. Households often add low-return activities while retaining risky or restricted resource use because the new activity cannot meet basic needs. Evaluation should measure net income, variability, labour demand, market distance, start-up debt and resilience to shocks. It should also assess environmental displacement, such as whether intensified farming outside the park increases erosion or forest clearing. A sustainable alternative must be economically credible and ecologically compatible.

Restoration employment can connect conservation and livelihood goals when designed carefully. Community members can be paid for nursery work, invasive-species control, fire management, boundary maintenance, monitoring and habitat restoration. Such work should meet decent-work standards, include training and avoid substituting unpaid community labour for agency responsibilities. Selection should be transparent and include women in technical and supervisory roles. Ecological performance, such as seedling survival or restored area, should be monitored alongside employment days and wages.

Ecotourism proposals require demand realism. The presence of biodiversity does not guarantee sufficient visitors or revenue to support many households. Product development must consider access, safety, interpretation, seasonality, conservation limits and competition with other destinations. Community enterprises may provide guiding, food, accommodation, cultural interpretation or craft products, but benefit agreements and quality systems are needed. Pilot projects should be evaluated before they are scaled, and tourism should complement rather than replace diverse livelihood strategies.

A grievance mechanism can improve both fairness and data quality. Residents should be able to submit a complaint orally or in writing, receive a tracking number, understand the review process and appeal a decision. Aggregate data on complaint type, community, response time and outcome can identify recurring barriers. Independent or joint oversight may be necessary where the complaint concerns the park agency itself. The system should also protect complainants from retaliation and provide culturally appropriate support for women and people with limited literacy.

The intervention-preference rankings should not be treated as a referendum authorising all requested access. Multiple-response questions measure priority or desire, not ecological feasibility or legal compatibility. Water and markets can be advanced through standard development planning, while forest and timber access require resource assessment and negotiated rules. Reporting these distinctions respects respondent voice without converting preference into policy automatically. The role of research is to inform a deliberative process, not replace it.

Strong conclusions from archival data should rely on robust descriptive signals. Near-zero benefit receipt, 83.1% reported income inadequacy and widespread activity limitation are directly visible and do not depend on modelling assumptions. By contrast, a precise estimate of the park's causal income effect would require longitudinal or comparison data. The article therefore makes a strong governance conclusion about recorded support access and a cautious causal conclusion about livelihood change. This combination is more defensible than either statistical overclaiming or excessive reluctance to acknowledge a substantive gap.

The environmental rationale for equitable support is not that poverty inevitably causes conservation harm. Such a claim would stigmatise communities and overlook commercial or institutional drivers of degradation. The rationale is that fair, workable rules and credible opportunities can strengthen cooperation and reduce incentives for conflict. Communities also possess knowledge relevant to monitoring and restoration. Partnership should therefore be based on rights, capability and shared responsibility rather than on portraying residents only as threats to biodiversity.

Spatial variation among the four support-zone communities deserves attention in a new study. Distance to park boundaries, road access, market connectivity, land availability and prior occupational structure may shape both exposure and programme access. Pooling can conceal a community where a benefit worked or where restrictions were especially severe. A stratified design should report comparable indicators for each community and use qualitative evidence to explain differences. Community-level reporting must still avoid identifying vulnerable households in small samples.

The relationship between income adequacy and conservation support should be tested rather than assumed. Future questionnaires can measure trust, perceived fairness, rule knowledge, willingness to cooperate and reported livelihood security with validated multi-item scales. Analysis can then assess associations while controlling for community and

livelihood type. Even such a design would remain observational, but it would clarify mechanisms more effectively than a single adequacy item or a general significance statement.

A current evaluation should also document external shocks. Commodity prices, road conditions, climate variability, illness, migration and national economic change can affect income independently of the park. A timeline developed with communities and administrative data would identify major events and reduce the risk of attributing every change to conservation rules. This is particularly important when re-examining a long-established protected area whose social and market environment has changed over decades.

Data stewardship should be agreed with communities. Household records contain sensitive information about income, resource use and possible rule violations. Access controls, anonymisation and retention periods should be specified before collection. Communities should receive understandable summaries and opportunities to correct contextual errors. Responsible data practice can improve trust and research quality while preventing a livelihood survey from becoming an unintended enforcement instrument.

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Conflict of interest

The author declares no conflict of interest.

Author contribution

The author conceived and conducted the study and is the sole credited author.

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