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Fragile Finance, Unstable Livelihoods: Financial Buffers, Coastal Exposure and Survey Measurement in South India

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ABSTRACT

This article reassesses economic stability and financial fragility among 384 coastal fishing households in Ramanathapuram, Tamil Nadu, and Thiruvananthapuram, Kerala. The inquiry integrates household finance, occupational adjustment, post-harvest exposure and institutional indicators using a harmonization-first empirical strategy. The two original district files each contain 192 respondents, but several financial variables have different measurement scales across districts, and existing published descriptive and regression values do not reproduce directly from these records. Accordingly, cross-district rupee comparisons for savings and income are withheld pending a codebook, while eight consistently coded two-category items are analysed transparently as response categories. Chi-square comparisons and a parsimonious logistic specification show strong geographic differences in responses, with a site-adjusted association for the livelihood-stability response category but no independently precise coefficient for most included household items. Findings concern conditional patterns in a purposive cross-section, not causal effects of debt, savings or government programmes. This audit establishes how careful coding, sensitivity analysis and inference boundaries are essential to credible policy evidence on coastal livelihoods.

Keywords: coastal livelihoods; household finance; small-scale fisheries; measurement harmonization; economic vulnerability.

1.INTRODUCTION

The economic position of a small-scale fishing household cannot be described adequately by the size of its most recent catch or a single monthly income observation. Fishing earnings arise from an uncertain combination of effort, vessel access, fuel costs, weather windows, landing-site bargaining and time-sensitive markets. The household must finance consumption continuously even when fishing trips cannot be undertaken or when a catch is difficult to sell. The Food and Agriculture Organization (2024) places these vulnerabilities within the wider transformation of aquatic food systems, while the global small-scale fisheries assessment by the Food and Agriculture Organization, Duke University, and WorldFish (2023) emphasises the substantial contribution of often poorly enumerated fishing livelihoods. These insights imply that apparent financial participation and actual economic security are different policy outcomes.

Financial fragility has at least three distinguishable meanings. First, a household may have a low liquid buffer even if its productive assets have significant value. Second, it may face sizeable or inflexible repayments when cash receipts vary across weeks. Third, it may encounter an adverse production or marketing event that cannot be absorbed by savings, transfers or additional work. Deaton (1992), Morduch (1995) and Townsend (1994) provide complementary accounts of consumption smoothing under incomplete insurance. Contemporary financial inclusion evidence cautions that holding or using a financial service is not equivalent to reliable risk protection (Barajas et al., 2020; Demirgüç-Kunt et al., 2022). For coastal producers, this distinction matters because access to a lender and the ability to cope with a failed trip may be only weakly related.

Recent literature illustrates why fisher livelihood stability must be studied as an intersection of markets and household choices. Roscher et al. (2022) find heterogeneous outcomes from occupational diversification in small-scale fisheries, rather than a universally protective effect. Wang et al. (2024) identify stabilising diversification pathways in aquaculture–agriculture systems facing pandemic disruption, while Kabir (2023) examines

resilience in fish and shrimp value chains where market continuity and economic shocks interact. Indian evidence on the pandemic likewise records multiple coping strategies associated with assets and social circumstances (Suresh et al., 2023). These contributions discourage the assumption that any binary label for "other work" captures the economic returns to diversification.

In coastal South India, differences in institutional organisation, fish marketing, savings groups, insurance uptake and access to alternative income may shape the resilience of households exposed to similar biological production risks. Hossain (2024) identifies benefits from finance and community infrastructure in a recovery programme in coastal Tamil Nadu; that design, however, differs sharply from a contemporary cross-sectional survey without a nonparticipant comparison group. The study of fisherwomen's self-help groups in Tamil Nadu by Rajkumar et al. (2024) likewise suggests that institutional membership deserves substantive analysis, but a membership indicator cannot be assumed to measure bargaining power or actual benefits. The identification challenge is to separate what a respondent reports from what an economist wishes the item measured.

The present article revisits an original 384-household fisheries survey comprising 192 records from each of Ramanathapuram and Thiruvananthapuram. Its immediate objective is to distinguish usable empirical information from measurement differences that would otherwise create spurious cross-regional contrasts. The earlier working manuscript described monetary income and savings for both districts as though they were measured on a common numerical scale. Direct inspection instead shows that the Ramanathapuram data store amounts in rupees, whereas the corresponding Thiruvananthapuram columns contain small integer category codes. Pooling those columns as though identical monetary variables would transform a questionnaire difference into a fabricated economic gradient. It is therefore necessary to audit the measurement system before claiming a savings effect.

The substantive contribution is accordingly both economic and methodological. The paper examines the joint distribution of coded livelihood sustainability, post-harvest exposure, livelihood adjustment, finance-related items and institutional indicators; quantifies site-level contrasts; and estimates an explicitly labelled binary-response model using consistently recorded categories. It also documents the conditions under which stronger claims could be tested after recovery of value labels and survey documentation. Rather than reconstructing an appealing result through undocumented recoding, the analysis treats data provenance as part of the contribution. This strategy follows the broader emphasis on credible measurement and identification in applied microeconometrics (Wooldridge, 2010) and on multidimensional resilience in development research (Barrett & Constas, 2014).

2. REVIEW OF LITERATURE

2.1 Financial buffers and incomplete insurance

Precautionary saving offers a theoretical link between irregular earnings and the ability to maintain consumption. Under incomplete credit and insurance markets, households may accumulate liquid assets, adjust expenditures or draw on informal transfers when earnings fall. Deaton (1992) established the importance of liquidity constraints for consumption dynamics, while Townsend (1994) demonstrated that village-level risk sharing is incomplete even where social relations are dense. Morduch (1995) distinguishes income smoothing from consumption smoothing; in fisheries, reducing exposure through a second occupation is different from borrowing to maintain food expenditure after a poor landing. These mechanisms are relevant but cannot be inferred from a single observed savings number without corresponding information about timing and financial commitments.

Financial inclusion provides useful instruments but does not remove seasonal cash-flow risk. Barajas et al. (2020) review the limits and mechanisms of inclusion, while the Global Findex evidence describes differences between account ownership, payment use and resilience (Demirgüç-Kunt et al., 2022). Suri and Jack (2016) demonstrate that digital financial systems can affect poverty and gender outcomes in a specific institutional context; the result cannot be transferred as a coefficient to fishing households in India. Breza et al. (2020) show that learning costs matter when financial technologies are introduced. Access, actual use, quality and affordability must therefore be separately measured rather than collapsed into a single financial-capacity score.

Recent coastal evidence reinforces the need for this distinction. Hossain (2024) examines programme-linked finance and infrastructure after a disaster in Tamil Nadu and reports favourable household outcomes under a counterfactual research design. Rajkumar et al. (2024) analyse self-help group participation among fisherwomen, making clear that collective finance operates through social and organisational processes. Banerjee et al. (2023) connect financial inclusion to health-related outcomes across countries, which demonstrates that the welfare domain matters. Here the observed debt item has no variation within the two source files; it cannot supply an estimable coefficient for indebtedness. Source-specific categories may still describe finance access, but without interest rates, tenors or outstanding balance definitions they cannot quantify debt burden.

2.2 Livelihood diversification, ecological shocks and market exposure

Livelihood diversification is not a mechanically beneficial insurance policy. The sustainable livelihoods tradition emphasises assets, institutions and adaptive choices (Chambers & Conway, 1992; Scoones, 1998; Ellis, 2000). In fisheries, the seasonal costs of switching between activities can be high, and additional work may represent distress rather than opportunity. Roscher et al. (2022) review evidence of mixed livelihood outcomes from diversification in small-scale fisheries. Wang et al. (2024) show more favourable income and food-availability pathways in a particular mixed-production setting. The difference

suggests that occupational content, returns and time allocation are essential for interpretation.

Exposure also operates through market systems. A landing may be productive but leave little income if perishability, transport disruption, intermediary power or missing cold storage prevent sale. Kabir (2023) examines resilience among Bangladesh fish and shrimp value-chain actors during the pandemic, highlighting business continuity as distinct from production. Suresh et al. (2023) document the practical challenges faced by marine fishers in India under restrictions and income disruptions. The relevance to the present survey is that a post-harvest item should not be equated automatically with a measured percentage loss of income: it may register the occurrence of loss without its magnitude, timing or share of catch.

2.3 Institutional support and social differentiation

Institutions affect economic outcomes through coordination, eligibility and the ability to use resources when a shock arrives. Ostrom (1990) shows that collective arrangements can solve coordination problems under appropriate rules; Kabeer (1999) emphasises that possession of resources is not equivalent to agency. An SHG membership variable can indicate access to a network but not its governance, credit volume or perceived fairness. Contemporary evidence from Tamil Nadu (Rajkumar et al., 2024) underscores the analytical value of distinguishing formal membership from empowerment outcomes. Economic well-being may also differ by household responsibilities and gendered work even when survey responses are apparently similar.

Government fisheries programmes address a broad package of infrastructure, welfare, production and marketing needs. The Department of Fisheries' recent policy orientation incorporates sector formalisation and microenterprise support; the global FAO reports similarly place small-scale actors within sustainable value chains (Food and Agriculture Organization, 2022, 2024). Yet awareness of an initiative is not verified receipt of a benefit. It cannot identify benefit size, application success, timing, exclusion or the quality of frontline services. The same caution applies to health insurance: possession or awareness does not establish active policy status, cashless claims or financial protection after illness.

Regional differentiation requires particular care. Small-scale fishing environments vary across coastlines, but two purposively sampled districts are not representative samples of their states. Comparative research on coastal recovery (Hossain, 2024), fish-chain vulnerability (Paul et al., 2025) and livelihood capital (Nadarajah et al., 2025) provides reasons to investigate place-specific configurations rather than impose a universal fisher profile. Differences in questionnaire scale may be just as influential as differences in local economic conditions. Without documentation, a statistical contrast between monetary rupees and coded categories is not a comparison of household wealth.

2.4 Conceptual framework, hypotheses and identification boundary

The conceptual framework treats exposure, household buffers, adjustment strategies and institutional interfaces as distinct domains associated with an observed livelihood-stability response. Financial buffers are conceptually represented by savings and debt terms, although their cross-site numerical analysis is restricted by incompatible recorded scales. Shock exposure is represented by the post-harvest item; occupational adjustment by additional work and migration; and institutional interface by programme awareness, insurance response and moneylender-category reports. Site characteristics are retained as a contextual control. These are propositions about associations rather than validated causal arrows (Dercon, 2002; Roscher et al., 2022; Handayati et al., 2025).

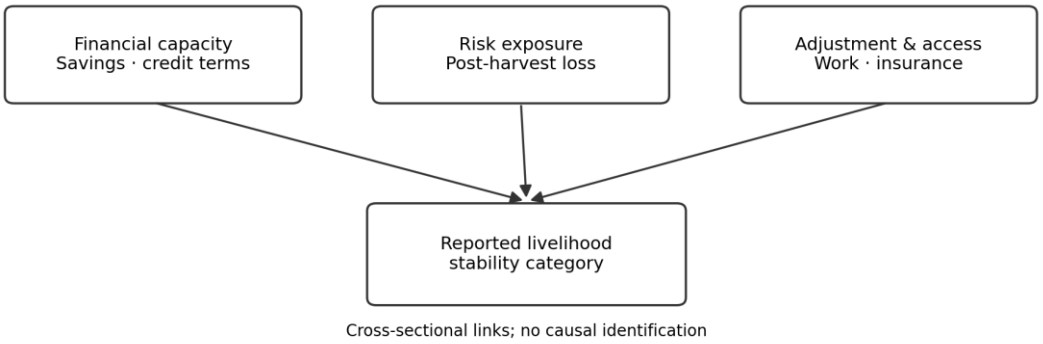


Figure 1. Conceptual framework of observed and partially measured livelihood-stability domains. Arrows indicate hypotheses, not established effects.

Three testable expectations guide the restricted models. H1 anticipates heterogeneity in the recorded stability response across coastal sites. H2 asks whether the two-category post-harvest and adjustment items are associated with the stability response after site adjustment. H3 examines whether institutional and finance-source codes add explanatory information after controlling for site. A stronger hypothesis about savings is not tested because one district records rupee amounts while the other records ordinal codes without an established monetary crosswalk. This explicit non-test protects the distinction between conceptual importance and empirically identified evidence (Wooldridge, 2010).

3. DATA AND METHODS

3.1 Survey coverage and observational unit

The analysis is based on two original district-level household files, each with 192 cases. One refers to Ramanathapuram in Tamil Nadu and the other to Thiruvananthapuram in Kerala, yielding 384 respondent records. Both files contain questionnaire fields on family structure, fishing participation, household conditions, financial transactions, fisheries marketing, work and migration, health access and institutional awareness. The observational unit is a recorded fishing household. Sampling probabilities, recruitment timing and survey-year documentation are not recoverable from the available tables and data alone. Consequently, the study does not apply population survey weights or assert state-level representativeness. No household observations are invented to force previously reported percentages to match.

The regional files were first inspected separately and then combined only for fields with identical names and compatible observed support. In Ramanathapuram, the household-income column contains rupee-like numerical values, with an observed median of ₹12,000 and values from ₹9,000 to ₹27,000. In Thiruvananthapuram, the identically named column instead contains integers from 1 to 4, evidently indicating categories. Similarly, recorded savings are rupee amounts in Ramanathapuram and integers in Thiruvananthapuram. These variables cannot be pooled in a common monetary regression without the relevant instrument and value-label documentation. The analysis therefore presents them as an explicit comparability limitation, not as false financial precision.

3.2 Harmonisation, coding and missingness

The harmonised analysis retains the original categories 1 and 2 for seven questionnaire items: livelihood sustainability, post-harvest loss, additional work, migration, awareness of government initiatives, health-insurance scheme response and moneylender-source response. The original response value is displayed in the first descriptive table and the conditional regression estimates the probability of code 1. This is a deliberate design choice: the supplied CSV files do not contain the categorical value-label dictionary needed to certify that 1 corresponds to “yes” for every field. Narrative interpretation consequently refers to category 1, not to a verified affirmative response. The same technique prevents reversal of signs simply because the category labels were guessed.

All seven two-category survey items are observed for 384 records in the present files. The generic debt column equals 2 in all 384 observations. Because a constant contains no explanatory variation, a conventional logit coefficient for this item is unidentified and is not estimated. The SHG membership item has only 18 code-1 observations and none in the Thiruvananthapuram file, creating near-complete dependence on site; it is therefore not entered into the main multivariable regression. Missing survey metadata and value labels are documented rather than replaced with convenient assumptions. Numerical inconsistencies between the original draft and the present records are handled by recalculating from the original rows.

3.3 Outcomes and explanatory variables

The primary outcome, Y_i, equals one if the recorded Empt_Sustainability item is coded 1 and zero if coded 2. This is an analysis of a questionnaire response category—not an independently validated poverty threshold or observed time series of income stability. The explanatory variables similarly indicate category 1 for Post_Harvest_Loss, Other_Work, Migration, Govt._Initiative_Awareness, Health_Insurance_Scheme and Debt_Money_Lenders. The district indicator takes one for Thiruvananthapuram and zero for Ramanathapuram. This parsimonious list is chosen because these columns use the same observed binary support in both districts and have complete records; it does not assume that each item measures the underlying economic construct perfectly.

3.4 Estimation and statistical inference

The principal specification uses maximum-likelihood logistic regression for the category-1 stability response. If X_i denotes the six questionnaire indicators and K_i represents the Kerala-site indicator, the conditional log odds are written as:

$$\log \{ \Pr(Y_i=1 \mid X_i,K_i) / [1 - \Pr(Y_i=1 \mid X_i,K_i)] \} = \beta_0 + \Sigma_{j=1}^{6} \beta_j X_{ji} + \gamma K_i.$$

A site-only model provides a baseline comparison. The expanded model adds six consistently recorded questionnaire items and reports McFadden pseudo-R^2 and likelihood-ratio diagnostics. The coefficient plot presents odds ratios and 95% confidence intervals; the corresponding table supplies untransformed logit coefficients, standard errors and p values. Results should not be described as impacts or elasticities. Because the two districts were purposively selected, conventional standard errors quantify uncertainty conditional on the model and sample, not uncertainty under a probability sample of coastal India. The analysis avoids significance-star inflation and preserves full interval estimates.

3.5 Robustness, provenance and ethics

The principal sensitivity check is a comparison with the site-only model, which identifies how much the observed regional contrast shifts when the six response categories are included. The sign and precision of each added item are reported rather than selectively omitting non-significant coefficients. Additional modelling that would require pooling rupee savings with ordinal savings is intentionally excluded. In a reproducible extension, the archived survey questionnaire and SPSS labels should be used to confirm the meaning of codes 1 and 2; monetary categories should be harmonised only through a documented value-label crosswalk and relevant time reference; and multiple operationalisations of stability should be

compared after the original item wording is recovered.

Research ethics documentation, original fieldwork dates and the precise informed-consent process are not established by the present working materials. No claim of institutional review approval or participant consent is therefore made without confirmation. The text reports aggregate quantities only and does not expose respondent identifiers. The data should be stored with appropriate restrictions because household-level financial, health and occupational records may be sensitive. If an editor requests replication files, a screened and de-identified extract and a codebook should be prepared according to the authors' actual permissions and local institutional requirements.

4. RESULTS AND ANALYSIS

4.1 Regional profile and comparability

Table 1 re-establishes the observable distribution of survey categories. Both districts contribute exactly 192 households. The livelihood-sustainability item is coded 1 for 124 households in Ramanathapuram and 154 in Thiruvananthapuram, giving site-specific shares of 64.6% and 80.2%, respectively. These are the proportions of recorded code 1, not independently verified percentages of economically stable households. The prior working manuscript reports different stability shares, and those figures should not be carried into the revised article without evidence of an alternative sample, weighting scheme or coding rule. The updated comparisons are direct counts of the observed rows.

Table 1. Survey response code 1 by site

Questionnaire item	Ramanathapuram	Thiruvananthapuram
Livelihood sustainability	124/192 (64.6%)	154/192 (80.2%)
Post-harvest-loss item	107/192 (55.7%)	161/192 (83.9%)
Additional-work item	127/192 (66.1%)	85/192 (44.3%)
Migration item	121/192 (63.0%)	172/192 (89.6%)
Government-awareness item	149/192 (77.6%)	95/192 (49.5%)
Health-insurance item	109/192 (56.8%)	80/192 (41.7%)
Moneylender-credit item	102/192 (53.1%)	172/192 (89.6%)
SHG membership	18/192 (9.4%)	0/192 (0.0%)

Note. Each cell displays the count and percentage coded 1; the meanings of original value labels require confirmation from the archived instrument. N = 192 per district.

The regional distribution is not uniform. Post-harvest loss is coded 1 in 107 Ramanathapuram records and 161 Thiruvananthapuram records; the additional-work item is coded 1 in 127 and 85 records, respectively. Government-initiative awareness is coded 1 in 149 versus 95 records. These raw differences are large enough to merit investigation, but without a coding dictionary it would be premature to call one site more exposed to losses, more diversified or better supported. Even with verified labels, site differences could reflect sampling, season, harbour composition, target population or questionnaire administration rather than institutional performance.

4.2 Tests of site heterogeneity

Table 2 provides Pearson chi-square comparisons for each binary item. These tests examine independence between recorded response category and site. They do not determine which response category is favourable and cannot account for village-level clustering or the purposive selection of fishing households. The exercise is nevertheless informative because it establishes that coding patterns differ substantially between the two source files. The strongest differences concern moneylender-source category, post-harvest reporting, migration, government-awareness category and additional-work responses. Multiple comparisons also raise the possibility of chance rejections; the table is treated as exploratory and reports unadjusted p values without a causal interpretation.

Table 2. Pearson chi-square tests of differences in response categories by site

Item	χ^2 (df=1)	p value
Empt Sustainability	10.96	0.0009
Post Harvest Loss	34.70	<.0001
Other Work	17.70	<.0001
Migration	36.00	<.0001
Govt. Initiative Awareness	31.58	<.0001
Health Insurance Scheme	8.17	0.0043
Debt Money Lenders	60.66	<.0001
SHG Member	16.85	<.0001

Note. Each test uses 384 respondents and the observed 1/2 response codes. P values are descriptive exploratory tests; they do not validate the meaning of value labels.

The livelihood-sustainability category differs significantly by site (χ^2 test p approximately .001). However, the test does not establish that households in one district have greater objective resilience: the item is a binary reported status without a validated threshold, and the sites differ on many unmeasured dimensions. The moneylender item also displays a sharply contrasting code distribution, but its relationship to actual informal borrowing depends on the item's exact phrasing. Some questions may record the absence of a source as 1, others its presence; a frequency table cannot settle the matter. Responsible economic analysis requires recovery of the SPSS value labels or original questionnaire definitions before substantive polarity can be assigned.

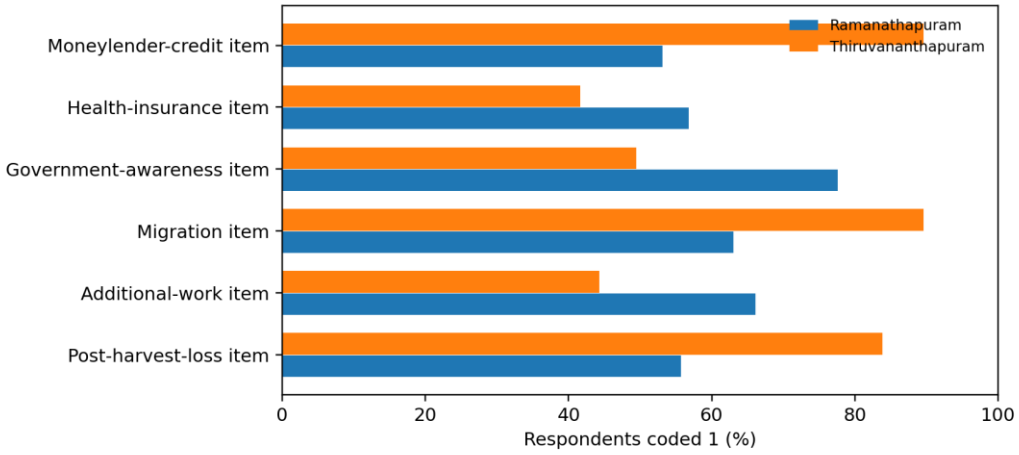


Figure 2. Percentage of respondents with survey response code 1 across six harmonised variables. Categories are not labelled affirmative without a verified codebook.

Figure 2 displays the scale of the cross-site compositional contrasts without turning category 1 into a presumed "yes." The graphical comparison is helpful because percentages of respondents in one category are immediately comparable across the districts even when rupee amounts are not. By contrast, comparing the numeric means of income and savings would conflate monetary values with survey codes. The figure therefore illustrates a defensible descriptive practice: use common categorical support while explicitly withholding interpretations that require missing metadata.

4.3 Baseline and adjusted logistic models

The primary logistic models examine which variables are conditionally associated with a code-1 livelihood-sustainability response. The site-only model establishes the unadjusted log-odds contrast; the expanded model adds the six harmonised questionnaire indicators. Neither predicts the underlying probability of future income stability, because such an outcome was not observed longitudinally. Table 3 reports the complete expanded specification and its uncertainty estimates, including non-significant results. This is preferable to reproducing the earlier manuscript's large protective coefficients without a verified data pipeline. Coefficients are interpreted relative to survey coding, not as economic intervention effects.

Table 3. Conditional logit model for livelihood-sustainability response code 1

Predictor	β	SE	OR	95% CI for OR	p
const	1.356	0.451	3.88	1.60–9.40	0.003
Post Harvest Loss	0.169	0.259	1.18	0.71–1.97	0.515
Other Work	-0.162	0.245	0.85	0.53–1.37	0.508
Migration	-0.325	0.290	0.72	0.41–1.28	0.263
Govt. Initiative Awareness	-0.420	0.266	0.66	0.39–1.11	0.114
Health Insurance Scheme	-0.304	0.238	0.74	0.46–1.18	0.201
Debt Money Lenders	-0.049	0.275	0.95	0.56–1.63	0.859
kerala	0.667	0.296	1.95	1.09–3.48	0.024

Note. N = 384; model likelihood-ratio p = 0.012, McFadden pseudo-R^2 = 0.040. All explanatory questionnaire indicators equal 1 if their raw response is coded 1; Kerala is the site indicator. ORs are not causal risk ratios.

The expanded model yields McFadden pseudo-R^2 of 0.040, indicating modest improvement over an intercept-only specification. The Thiruvananthapuram site coefficient is 0.667, corresponding to an odds ratio of 1.95 (p = 0.024) for code-1 stability response, conditional on the selected recorded items. This result is not a welfare ranking: two purposively sampled locations can differ in many latent characteristics. No individual household item reaches conventional significance after site adjustment, and the confidence intervals allow both economically relevant positive and negative associations. A low p value for a site indicator does not validate a particular narrative about coastal administration.

Most importantly, the post-harvest item has a positive coefficient for the coding convention used here, but it is statistically imprecise and cannot be interpreted until the 1/2 label is confirmed. The same applies to the additional-work, migration, moneylender and programme-awareness variables. Reversing a binary item's coding reverses the sign of its logit coefficient, while leaving underlying fit unchanged. This property is why guessing that category 1 always means "yes" can lead to apparently persuasive but fundamentally incorrect policy conclusions. The present estimates are reproducible conditional comparisons of precisely stated codes.

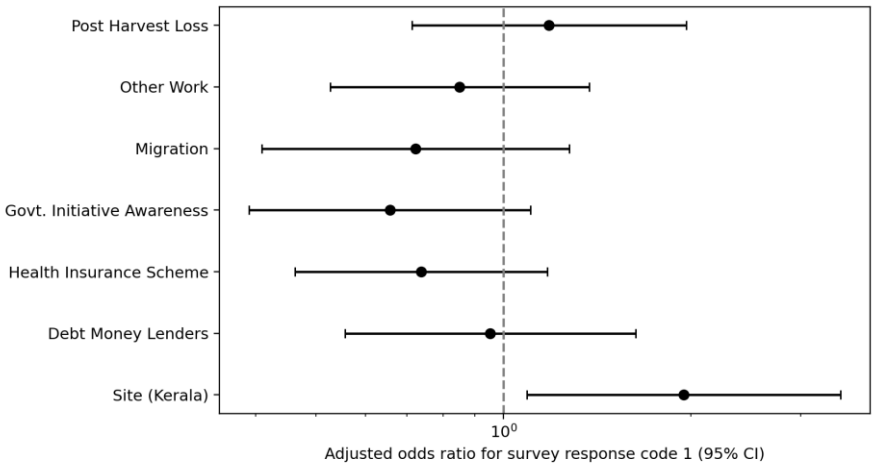


Figure 3. Adjusted odds ratios and 95% Wald confidence intervals for response code 1. Horizontal axis is logarithmic; vertical reference indicates OR = 1.

Figure 3 reinforces that the model is not a ranked list of proven determinants. Most confidence intervals overlap the null odds ratio of one, and apparent relative magnitudes should be compared with their uncertainty. One should not call post-harvest loss the "strongest negative effect" simply because a prior draft used that wording. The current model does not establish a negative signed effect with verified polarity, and standard errors are sufficiently wide to make categorical policy ranking unjustified. The appropriate role of the chart is to display estimated conditional contrasts and uncertainty transparently.

4.4 Sensitivity and diagnostic interpretation

Table 4 compares the site-only baseline with the expanded model. The nested comparison is useful for evaluating whether the included questionnaire items collectively improve observed discrimination of response code 1, while acknowledging that pseudo-R^2 is not a variance-explained percentage in the ordinary linear-model sense. Changes in the site coefficient after including covariates should not be termed mediation, because the explanatory indicators are contemporaneous and potentially affected by the same unobserved household characteristics. The model fits are reported to help readers judge proportionality between analytical complexity and actual information gained.

Table 4. Baseline versus expanded model diagnostics

Indicator	Site-only logit	Expanded logit
N	384	384
Slope parameters	1	7
Site odds ratio	2.22	1.95
AIC	444.64	450.52
McFadden pseudo-R^2	0.026	0.040
LR model p value	0.0006	0.0121

Note. Site-only model includes only the Thiruvananthapuram indicator. Expanded model includes six additional questionnaire response-category indicators.

The adjusted site odds ratio is smaller than the unadjusted estimate, indicating that part of the raw site contrast is statistically shared with other recorded response categories. That attenuation does not identify which underlying economic process is responsible. More comprehensive adjustment could change the estimate in either direction. In addition, the absence of a common monetary income or savings measure means the model does not adjust for financial buffer size; its conditional comparisons therefore remain vulnerable to omitted-variable bias. An apparently stable odds ratio across alternative specifications would not eliminate selection bias or missing survey-code information.

4.5 Substantive synthesis of the empirical evidence

Three distinctions are essential for the overall findings. First, raw response categories can be compared reliably across sites when their observed codes are identical, but their economic meaning remains conditional on the survey codebook. Second, sample composition and conditional associations are not equivalent to programme effectiveness, behavioural mechanisms or regional causal differences. Third, the original results table cannot be treated as a verified computational output merely because it appears in a manuscript: the corresponding harmonised regressor design is not presently reconstructible. These findings argue for a stronger reporting standard in cross-regional household surveys, particularly when a manuscript combines multiple sites with inconsistent monetary-scale fields.

5. DISCUSSION

5.1 Financial inclusion is not identical to financial resilience

The most important lesson is that household financial security must be measured rather than assumed. Deaton (1992) and Morduch (1995) explain why expenditure can remain smooth despite volatile earnings, while Barajas et al. (2020) and Demirgüç-Kunt et al. (2022) distinguish financial access from effective risk management. The present survey contains potentially useful income and savings information, yet its cross-site format does not permit a defensible pooled monetary estimate. Such an omission cannot be repaired by citing findings from another context or by replacing missing values with convenient figures. Inference about financial buffers should wait until both districts' value labels and accounting periods have been confirmed.

Current fisheries evidence similarly points to the coexistence of productive and financial constraints. Hossain (2024) shows why finance and infrastructure may jointly matter for recovery in coastal Tamil Nadu, while Nadarajah et al. (2025) stress broader capital availability in lagoon livelihoods. Those analyses support the economic relevance of a buffer hypothesis; they do not validate the coefficients in the current manuscript. The distinction between a hypothesis supported by external research and an estimate identified by the present dataset should remain explicit throughout policy discussion.

5.2 Diversification, post-harvest shocks and economic adjustment

Fisheries diversification is frequently recommended as insurance against seasonal volatility, but its protective value depends on activity quality and market opportunities. Roscher et al. (2022) document heterogeneity in realised diversification outcomes, whereas Wang et al. (2024) identify specific stabilising pathways in mixed aquaculture–agriculture households. Here the additional-work category is only a two-level response and gives no information on earnings, hours, work security or the chronology of occupational changes. Any regression coefficient therefore describes a broad report of work status, not the return to a diversification programme. The site differences in this variable should motivate collection of more detailed labour information rather than automatic promotion of any non-fishing work.

Post-harvest exposure is equally multidimensional. Fisheries systems can suffer from physical spoilage, market closures, transport delays, depressed prices and inventory problems. Kabir (2023) demonstrates the importance of value-chain continuity in fisheries shocks, while Suresh et al. (2023) describe Indian fishers' coping responses under extraordinary restrictions. The binary post-harvest item in this dataset records a category, not a certified monetary loss, and its polarity must be confirmed. Policy prescriptions concerning cold chains or market coordination may be sensible on broader sector evidence, including Food and Agriculture Organization (2024), but the present logit cannot estimate their expected effect on household stability.

5.3 Institutions, local context and uneven access

An institutional explanation requires measurement of what institutions actually provide. Self-help groups may facilitate savings, collective bargaining or information exchange, but membership alone does not certify these benefits. Rajkumar et al. (2024) examine multidimensional fisherwomen's empowerment in Tamil Nadu; Kabeer (1999) clarifies why access to resources and agency should not be conflated. In the present survey, SHG membership's code-1 category is rare and geographically concentrated, and it cannot be estimated as an ordinary independent site-adjusted effect without separation concerns. The appropriate next step is richer documentation of group activities and benefits, not a causal claim about the observed membership coefficient.

Government programme awareness and insurance items likewise represent narrow proxies. Ostrom (1990) and Sen (1999) emphasise institutional opportunities and substantive capabilities, while Hossain (2024) demonstrates that programme evaluation requires an identifiable counterfactual. The current survey has neither verified claims data nor programme

assignment rules. The observed awareness-category differences across sites should therefore guide a process evaluation that collects eligibility, application, approval, benefits and service quality separately. Regional interpretation should also consider selection into villages, landing centres and occupational roles, rather than attributing all differences to state policy.

5.4 Implications for empirical design and fisheries policy

The original manuscript's strongest financial conclusions depend on precisely the variables that require harmonisation. This creates an instructive case for research design. Conning and Udry (2007) show that rural financial relationships cannot be reduced to a source label, and Wooldridge (2010) explains why conditional regression is informative only when the dependent variable and covariates are correctly measured. The methodological contribution of the present article is therefore to demonstrate the value of validating codes, recognising constant regressors and reporting uncertainty rather than preserving attractive odds ratios that cannot be reproduced. The goal is not to discard a rich survey but to identify which portions are ready for inference.

6. CONCLUSION

This paper re-examined survey evidence on economic stability among 384 marine fishing households in two coastal districts of South India. Its central empirical finding is not a simple ranking of savings, debt and shock coefficients. The original files reveal important differences in the measurement of income and savings between districts, a constant generic debt response and site-level heterogeneity across several consistently recorded binary items. A transparent adjusted logistic model identifies a conditional site difference in the code-1 livelihood-sustainability response, but most household indicators are imprecise and cannot be labelled favourable or adverse without confirmed survey value labels. These results establish what the present cross-sectional data can and cannot support.

The broader economic argument remains important: coastal household stability is shaped by liquid buffers, the timing of fishing earnings, exposure to post-harvest shocks, occupational alternatives and institutional access. The research literature reviewed here provides strong reasons to study these mechanisms, yet the current empirical evidence cannot establish their causal effects. Improved data governance should therefore accompany fisheries policy. Harmonised survey instruments, detailed debt-contract data, verified insurance status, transaction-level losses and repeated household observations are necessary for rigorous evaluations. Further claims about household resilience should be built on those measurements rather than extrapolated from incompatible numeric fields or unverifiable regression tables.

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