

INCOME SHOCK, ASSET DAMAGE, AND LOCAL MARKET PRICE RESPONSE ON POST-FLOOD HOUSEHOLD CONSUMPTION PATTERN CHANGE: A PLS-SEM STUDY OF COASTAL COMMUNITIES IN LANGSA CITY, INDONESIA

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Received August 30, 2026; Revised September 29, 2026; Accepted September 29, 2026; Published October 12, 2026

ABSTRACT

Flood disasters routinely disrupt the income streams, productive assets, and local market conditions of coastal households, yet quantitative evidence on how these simultaneous shocks reshape household consumption remains scarce in the Indonesian context. Most existing studies are qualitative or descriptive and do not test the underlying behavioral mechanisms in an integrated model. This study examines the effect of income shock, productive asset damage, and post-disaster aid effectiveness on household consumption pattern change, both directly and through the mediating role of local market price response, among coastal households in Langsa City following a flood disaster. A survey of 158 household heads or housewives in five flood-affected sub-districts, selected through stratified random sampling by livelihood group, was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with 500 bootstrap subsamples. The measurement model demonstrated adequate convergent and discriminant validity, whereas model fit was marginal (SRMR = 0.089). Income shock had a significant positive effect on both local market price response and household consumption pattern change, whereas productive asset damage, aid effectiveness, and local market price response itself did not significantly predict consumption change, and no significant mediation was found. These findings indicate that income loss, rather than asset damage, aid distribution, or price movement, is the dominant driver of post-disaster consumption adjustment. The study concludes that market recovery and social protection policies in flood-prone coastal cities should prioritize rapid income restoration for affected households.

Keywords: *Income shock, household consumption pattern, local market price response, post-flood recovery, PLS-SEM.*

INTRODUCTION

Natural disasters such as floods do not merely damage physical infrastructure; they also act as an extreme environmental disruption that radically reshapes market conditions and consumer behavior at the household level (Deryugina, 2022; Shaikh et al., 2026). The most direct and immediate transmission channel of this disruption is income loss, since a flood that paralyzes fishing, aquaculture, and small trading activities instantly halts the cash flow of coastal households. Agarwal et al. (2024), using individual-level financial transaction data from the 2015 Chennai flood, found that household consumption dropped by roughly 11 percent during the disaster and that this decline was driven primarily by



income shocks rather than by price shocks, with affected households smoothing part of the loss through credit and savings. A broadly similar pattern was documented by Wang & Zhao, (2023), who showed that natural disasters widen household expenditure inequality because low-income households have far fewer buffers to protect their consumption levels than wealthier ones.

When households face a sudden threat to their economic stability, consumer behavior theory in crisis situations suggests that they reconstruct their purchasing hierarchy, suppressing expenditure on secondary or discretionary goods (wants) while concentrating the remaining budget on functional products with high survival utility (needs). This behavioral shift is closely related to the scarcity mindset, in which limited resources narrow consumers' cognitive focus toward the scarce resource itself, a phenomenon that Cheng et al. (2023) describe as an asymmetric effect of scarcity on the choice between hedonic and utilitarian consumption; under a strong scarcity mindset, windfall or emergency resources tend to be allocated to utilitarian rather than hedonic goods. A related psychological mechanism was reported during the COVID-19 pandemic by Omar et al. (2021), who found that perceived scarcity heightened anxiety and, through that anxiety, triggered defensive purchasing behavior intended to secure essential supplies.

Beyond the loss of income, disasters also destroy productive assets, such as boats, fishing gear, and aquaculture ponds, that coastal households depend on for their livelihoods (Pham & Saizen, 2023; Mutanda & Nhamo, 2026). Karki et al. (2022) demonstrated in the aftermath of the 2015 Nepal earthquake that when livelihood interventions are delayed or insufficient, asset-poor households are forced into a slower and more fragile recovery trajectory, occasionally reallocating scarce productive assets, such as livestock, to smooth short-term consumption. Whether such asset damage translates immediately into a measurable shift in consumption baskets, however, remains an open empirical question, particularly outside the agrarian or highland contexts in which most of this literature has been developed.

The dynamics of post-disaster consumption are further complicated by disruptions in the functioning of local markets. When flooding severs the main logistics routes into a city, the supply of staple food commodities in traditional markets falls sharply, which in turn triggers a local price spike (Rojas-Reyes et al., 2024; Basyigit et al., 2025). Under such circumstances, purchase decisions become highly vulnerable, since a decline in purchasing power coincides with rising prices for the very goods households need most. Evidence on product and price scarcity from Barton et al. (2022) and the meta-analytic synthesis by Ladeira et al. (2023) indicate that when supply becomes restricted, consumers frequently abandon brand loyalty in favor of price sensitivity and product availability, a mechanism that could plausibly connect local market price shocks to household consumption pattern change.

Finally, government and community disaster aid is commonly expected to cushion the economic shock experienced by affected households. Yet the effectiveness of such aid in shaping consumption behavior is rarely examined quantitatively, since most post-

disaster assistance in Indonesia remains concentrated on short-term emergency response, such as food packages and temporary shelter, rather than on restoring household income streams or productive capacity in a sustained manner.

In Indonesia, quantitative survey evidence on changes in household consumption patterns after a shock has begun to accumulate, for example in the study of Bestari & Noor, (2022) on household consumption change during the COVID-19 pandemic, and in the livelihood vulnerability literature on small-scale fishing households in Indonesia and other developing-country settings (Fiorella et al., 2021; Okronipa et al., 2023; Nisa & Lukitawati, 2026). However, research that simultaneously integrates income shock, asset damage, aid effectiveness, and local market price response into a single structural model, and that tests these relationships specifically among coastal communities repeatedly exposed to flooding, remains very limited. This gap is consistent with the broader observation that empirical studies of post-disaster household economic behavior at the micro level are still considerably scarcer than macro-level damage assessments.

This research gap is theoretically and practically important. Theoretically, integrating income shock, asset-based vulnerability, aid effectiveness, and local market price response within one model allows a direct empirical test of which channel dominates the transmission from disaster to consumption change, rather than assuming all channels operate with equal force. The main novelty of this study lies in testing these four channels simultaneously in a single structural model, with local market price response as a mediating channel, for post-flood coastal households in an Indonesian small city. Practically, understanding which channel matters most is essential for retail micro, small, and medium enterprises (MSMEs) in designing adaptive stock management strategies, and for the Langsa City Government in formulating a market recovery policy that is properly targeted rather than dispersed across every possible channel. The proposed integrated model addresses this problem directly: it estimates all direct and indirect paths from the three exogenous shocks to consumption pattern change at once, so that the relative strength of each path, and whether local market prices actually transmit any of the shocks into household spending, can be compared within the same model.

Based on this background, this study addresses three research questions: first, how do income shock, productive asset damage, aid effectiveness, and local market price response jointly influence household consumption pattern change among flood-affected coastal households in Langsa City; second, does local market price response mediate the relationship between the exogenous economic shocks and household consumption pattern change; and third, which factor exerts the dominant influence and therefore deserves priority in post-disaster market recovery policy. Accordingly, this study aims to empirically test a structural model of post-flood household consumption pattern change using Partial Least Squares Structural Equation Modeling (PLS-SEM), an approach well suited to the exploratory, prediction-oriented, and moderately sized sample that characterizes this research setting (Hair & Alamer, 2022). By simultaneously estimating the direct and indirect paths among five latent constructs rather than testing each relationship in isolation, this study offers a more complete empirical account of how a

single flood event propagates through a coastal household economy, from the initial shock to income and assets, through the local market, and finally into the composition of everyday household spending.

RESEARCH METHOD

This study employed a quantitative approach with an explanatory, cross-sectional survey design intended to test the causal relationships among latent constructs in a structural model. The research was conducted in the flood-affected coastal areas of Langsa City, Aceh Province, specifically in the sub-districts of Langsa Barat, Langsa Timur, Langsa Baro, Langsa Lama, and Langsa Kota. The unit of analysis was the household, represented by the head of household or the housewife who was most knowledgeable about the household's expenditure pattern.

The population comprised coastal households affected by flooding in Langsa City. Sample size was determined following the guideline of (Hair, Black, et al., 2019), who recommend that the minimum sample size for a PLS-SEM study be several times the number of indicators used in the measurement model. Using stratified random sampling based on the primary livelihood group of coastal residents, that is, salaried employees, fish traders or micro-enterprise owners, aquaculture pond owners, oyster gatherers or pond workers, boat-crew fishers, and boat-owning fishers, a total of 158 valid questionnaires were collected and used for analysis (Sekaran & Bougie, 2020).

Data were collected through a structured questionnaire distributed directly to respondents by trained field enumerators. The major flood examined in this study began to hit Langsa City on 26 November 2025, and data were collected from 3 to 10 August 2026, approximately eight months after the onset of the flood. Because the flood was a discrete, sudden-onset event, the questionnaire applied a structured recall method so that respondents could describe both their pre-flood (normal) and post-flood (emergency and recovery) conditions from the same unit of analysis, thereby allowing within-household comparison without requiring a true panel dataset. Every indicator was measured using a five-point Likert scale ranging from strongly disagree to strongly agree. Prior to full-scale distribution, the questionnaire wording was reviewed for clarity and cultural appropriateness with several coastal residents, and minor phrasing adjustments were made to ensure that recall-based questions about pre-flood and post-flood spending were interpreted consistently across respondents with differing levels of formal education.

The research model comprised five latent variables. Income shock was measured with four indicators, productive asset damage with three indicators, and post-disaster aid effectiveness with four indicators, all treated as exogenous constructs. Local market price response, measured with three indicators, was positioned as a mediating construct, while household consumption pattern change, also measured with three indicators, served as the endogenous outcome construct. All constructs were specified as reflective measurement models. The hypothesized structural relationships, presented in Figure 1, link income shock, asset damage, and aid effectiveness to local market price response; link income

shock and aid effectiveness directly to consumption pattern change; and link local market price response to consumption pattern change.

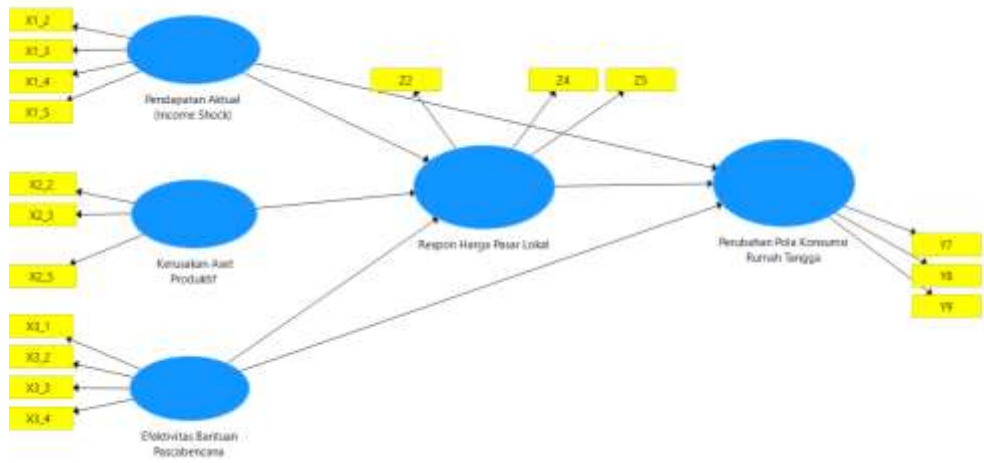


Figure 1. Hypothesized Structural Model of Post-Flood Household Consumption Pattern Change

Indicators for each construct were adapted from one primary source per construct in the empirical literature reviewed in the Introduction, and their wording was adjusted to the post-flood coastal household context of Langsa City (Table 1). The indicator codes in Table 1 correspond to the indicators retained in the final measurement model (Table 3).

Table 1. Operationalization of Constructs and Sources of Indicators

Construct	Retained Indicator Codes	Source of Indicators
Income Shock	X1_2, X1_3, X1_4, X1_5	Agarwal et al. (2024)
Productive Asset Damage	X2_2, X2_3, X2_5	Pham & Saizen (2023)
Aid Effectiveness	X3_1, X3_2, X3_3, X3_4	Karki et al. (2022)
Local Market Price Response	Z2, Z4, Z5	Fiorella et al. (2021)
Consumption Pattern Change	Y7, Y8, Y9	Bestari & Noor (2022)

Note: Indicators were adapted from the source listed for each construct and reworded to fit the post-flood coastal household context; each indicator was measured on a five-point Likert scale.

Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) processed with SmartPLS. PLS-SEM was chosen because it is appropriate for models with multiple latent constructs, is robust to non-normal data distributions, and emphasizes the prediction of endogenous constructs rather than strict confirmatory model fit, which matches the exploratory character of this study (Hair & Alamer, 2022).

The analysis followed the two-stage approach recommended for PLS-SEM. The first stage evaluated the measurement (outer) model through indicator reliability (outer

loadings), internal consistency reliability (Cronbach's alpha and composite reliability), and convergent validity (average variance extracted, AVE) (Hair & Alamer, 2022). Discriminant validity was assessed with the Fornell-Larcker criterion and the heterotrait-monotrait ratio of correlations (HTMT), the latter being the currently preferred criterion because it is less prone to falsely indicating discriminant validity than the Fornell-Larcker approach (Roemer et al., 2021). Collinearity among indicators and among constructs was examined using the variance inflation factor (VIF).

The second stage evaluated the structural (inner) model through the coefficient of determination (R square), the effect size (f square), the path coefficients, and the model fit index (standardized root mean square residual, SRMR) (Hair, Risher, et al., 2019). The significance of the path coefficients and of the specific indirect effects was tested using a bootstrapping procedure with 500 subsamples, generating t-statistics and p-values for each hypothesized relationship at a significance level of 5 percent (Hair, Risher, et al., 2019). The number of bootstrap subsamples (500) exceeds the number of valid observations ($n = 158$), and the p-values of all structural paths lie far from the 5 percent threshold ($p < 0.001$ for the two significant paths and $p \geq 0.446$ for the remaining paths), so the significance decisions are unlikely to change with a larger number of subsamples. Because PLS-SEM guidelines recommend 5,000 or more subsamples for stable final results (Hair & Alamer, 2022), future studies should adopt at least this number.

RESULTS AND DISCUSSION

Results

Respondent Characteristics

The demographic and socioeconomic characteristics of the 158 respondents are presented in Table 2.

Table 2. Characteristics of Respondents

Characteristic	Category	Frequency	Percentage
Gender	Male	87	55.1%
	Female	71	44.9%
Sub-district of Residence	Langsa Barat	59	37.3%
	Langsa Timur	44	27.8%
	Langsa Baro	23	14.6%
	Langsa Lama	16	10.1%
	Langsa Kota	16	10.1%
Age	21-30 years	74	46.8%
	31-40 years	50	31.6%
	41-50 years	28	17.7%
	≥ 51 years	6	3.8%
Occupation	Salaried employee	53	33.5%
	Fish trader / MSME owner	45	28.5%
	Aquaculture pond owner	27	17.1%
	Oyster gatherer / pond worker	18	11.4%
	Boat-crew fisher	12	7.6%

Normal Monthly Income	Boat-owning fisher	3	1.9%
	< IDR 1,500,000	53	33.5%
	IDR 1,500,000 - 3,000,000	61	38.6%
	IDR 3,000,000 - 5,000,000	27	17.1%
	> IDR 5,000,000	17	10.8%
Total		158	100%

This study involved 158 respondents drawn from coastal households affected by flooding in Langsa City. Respondent characteristics were profiled based on gender, sub-district of residence, age, occupation, and estimated normal monthly income, as summarized in Table 2.

In terms of gender, respondents were dominated by men, accounting for 87 individuals or 55.1 percent, while women accounted for 71 individuals or 44.9 percent, indicating a fairly balanced but male-leaning composition consistent with the male-dominated nature of coastal fishing and aquaculture work. By sub-district, the largest share of respondents came from Langsa Barat (59 people, 37.3 percent), followed by Langsa Timur (44 people, 27.8 percent), Langsa Baro (23 people, 14.6 percent), and Langsa Lama and Langsa Kota with 16 people (10.1 percent) each, reflecting the fact that Langsa Barat and Langsa Timur are the most flood-exposed coastal sub-districts in the city.

By age group, the largest cohort was 21 to 30 years old (74 people, 46.8 percent), followed by 31 to 40 years old (50 people, 31.6 percent), 41 to 50 years old (28 people, 17.7 percent), and 51 years or older (6 people, 3.8 percent), showing that most respondents were of productive age. In terms of occupation, salaried employees formed the largest group (53 people, 33.5 percent), followed by fish traders or micro-enterprise owners (45 people, 28.5 percent), aquaculture pond owners (27 people, 17.1 percent), oyster gatherers or pond workers (18 people, 11.4 percent), boat-crew fishers (12 people, 7.6 percent), and boat-owning fishers (3 people, 1.9 percent). This composition indicates that respondents' occupational backgrounds were reasonably diverse, spanning livelihoods directly and indirectly tied to coastal economic activity.

Regarding estimated normal monthly income, the largest group earned between IDR 1,500,000 and IDR 3,000,000 (61 people, 38.6 percent), followed by those earning less than IDR 1,500,000 (53 people, 33.5 percent), between IDR 3,000,000 and IDR 5,000,000 (27 people, 17.1 percent), and more than IDR 5,000,000 (17 people, 10.8 percent). Overall, the respondent profile reflects a productive-age population with heterogeneous occupational backgrounds and predominantly low-to-middle normal income levels, a socioeconomic profile that provides an appropriate basis for analyzing changes in household consumption and post-disaster economic behavior.

Measurement Model (Outer Model) Evaluation

The measurement model was evaluated first, and Table 3 reports the outer loading of every indicator and the average variance extracted (AVE) of every construct.

Table 3. Outer Loadings and Average Variance Extracted (AVE)

Construct	Indicator	Outer Loading	AVE
Income Shock (Pendapatan Aktual)	X1_2	0.853	0.611
	X1_3	0.793	
	X1_4	0.748	
	X1_5	0.728	
Productive Asset Damage (Kerusakan Aset Produktif)	X2_2	0.730	0.577
	X2_3	0.788	
	X2_5	0.759	
Aid Effectiveness (Efektivitas Bantuan Pascabencana)	X3_1	0.790	0.617
	X3_2	0.848	
	X3_3	0.782	
	X3_4	0.717	
Local Market Price Response (Respon Harga Pasar Lokal)	Z2	0.863	0.731
	Z4	0.872	
	Z5	0.828	
Consumption Pattern Change (Perubahan Pola Konsumsi)	Y7	0.872	0.728
	Y8	0.843	
	Y9	0.844	

Table 4 then presents the reliability and convergent validity statistics of each construct, namely Cronbach's alpha, rho_A, composite reliability, and AVE.

Table 4. Construct Reliability and Validity

Construct	Cronbach's Alpha	rho_A	Composite Reliability	AVE
Productive Asset Damage	0.656	0.649	0.803	0.577
Aid Effectiveness	0.797	0.835	0.865	0.617
Income Shock	0.787	0.794	0.862	0.611
Consumption Pattern Change	0.816	0.829	0.889	0.728
Local Market Price Response	0.817	0.830	0.890	0.731

Table 3 presents the outer loadings and average variance extracted (AVE) for every indicator and construct. All outer loadings exceeded the minimum acceptable threshold of 0.70, with the lowest values recorded for X1_5 (0.728) and X2_2 (0.730), indicating that every indicator reliably reflected its intended construct (Hair & Alamer, 2022). Convergent validity was further confirmed by the AVE values in Table 4, which ranged from 0.577 to 0.731, all above the 0.50 threshold, indicating that each construct explained more than half of the variance in its indicators.

Internal consistency reliability was also satisfactory. Composite reliability values ranged from 0.803 to 0.890, well above the 0.70 cut-off, while Cronbach's alpha ranged from 0.656 to 0.817. Although the Cronbach's alpha for productive asset damage (0.656)

was marginally below the conventional 0.70 benchmark, its composite reliability of 0.803 confirmed adequate internal consistency, since Cronbach's alpha is known to be a more conservative estimate than composite reliability for constructs with a small number of indicators.

Discriminant validity was assessed using the Fornell-Larcker criterion and the heterotrait-monotrait ratio (HTMT). The square root of AVE for every construct, ranging from 0.760 to 0.855, exceeded its correlation with every other construct in the model, satisfying the Fornell-Larcker criterion. The HTMT values ranged from 0.200 to 0.699, all comfortably below the conservative 0.85 threshold, providing stronger evidence of discriminant validity than the Fornell-Larcker criterion alone, consistent with the recommendation of Roemer et al. (2021) to rely on HTMT as the primary discriminant validity criterion. Collinearity diagnostics further showed that all outer VIF values ranged from 1.119 to 2.368 and all inner VIF values ranged from 1.124 to 1.610, both well below the conservative threshold of 3.3, indicating that multicollinearity was not a concern in either the measurement or the structural model.

Structural Model (Inner Model) Evaluation and Hypothesis Testing

After the measurement model was confirmed, the structural model was evaluated, beginning with the coefficient of determination (R square) of the two endogenous constructs shown in Table 5.

Table 5. R Square of Endogenous Constructs

Endogenous Construct	R Square	R Square Adjusted
Consumption Pattern Change	0.204	0.189
Local Market Price Response	0.324	0.311

The path coefficients, effect sizes, and hypothesis testing results for the six hypothesized direct paths are reported in Table 6.

Table 6. Path Coefficients, Effect Size, and Hypothesis Testing Results

Hypothesis	Structural Path	β	f^2	t-value	p-value	Result
H1	Income Shock to Local Market Price Response	0.573	0.372	7.494	<0.001	Supported
H2	Income Shock to Consumption Pattern Change	0.438	0.150	4.842	<0.001	Supported
H3	Asset Damage to Local Market Price Response	-0.001	0.000	0.013	0.989	Not Supported
H4	Aid Effectiveness to Local Market Price Response	-0.010	0.000	0.081	0.936	Not Supported
H5	Aid Effectiveness to Consumption Pattern Change	0.062	0.004	0.763	0.446	Not Supported

H6	Local Market Price Response to Consumption Pattern Change	-0.019	0.000	0.183	0.854	Not Supported
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The specific indirect effects used to test the mediating role of local market price response are reported in Table 7.

Table 7. Specific Indirect Effects (Mediation Test)

Indirect Path	β	t-value	p-value	Result
Income Shock to Local Market Price Response to Consumption Pattern Change	-0.011	0.183	0.855	Not Sig.
Asset Damage to Local Market Price Response to Consumption Pattern Change	0.000	0.002	0.998	Not Sig.
Aid Effectiveness to Local Market Price Response to Consumption Pattern Change	0.000	0.014	0.989	Not Sig.

The coefficient of determination (R square) presented in Table 5 indicates that the exogenous constructs jointly explained 32.4 percent of the variance in local market price response and 20.4 percent of the variance in household consumption pattern change. Following the commonly applied benchmark in which values around 0.75, 0.50, and 0.25 are labeled substantial, moderate, and weak respectively, both endogenous constructs fall in the weak-to-moderate range, suggesting that meaningful predictors beyond those modeled here, such as household savings, social capital, or access to informal credit, likely also shape post-disaster market and consumption dynamics.

The structural model results and hypothesis tests are summarized in Table 6. Income shock exerted a significant, positive, and comparatively strong effect on local market price response ($\beta = 0.573$; $t = 7.494$; $p < 0.001$), supporting Hypothesis 1, with an f square of 0.372 indicating a large effect size. Income shock also exerted a significant, positive direct effect on household consumption pattern change ($\beta = 0.438$; $t = 4.842$; $p < 0.001$), supporting Hypothesis 2, with a medium effect size ($f^2 = 0.150$). These two paths were, by a considerable margin, the strongest and only statistically significant relationships found in the model.

In contrast, productive asset damage did not significantly predict local market price response ($\beta = -0.001$; $t = 0.013$; $p = 0.989$), so Hypothesis 3 was not supported. Aid effectiveness likewise showed no significant effect on either local market price response ($\beta = -0.010$; $t = 0.081$; $p = 0.936$) or consumption pattern change ($\beta = 0.062$; $t = 0.763$; $p = 0.446$), so Hypotheses 4 and 5 were not supported. Finally, local market price response itself did not significantly predict consumption pattern change ($\beta = -0.019$; $t = 0.183$; $p = 0.854$), so Hypothesis 6 was also not supported. The overall structural model showed an SRMR of 0.089, which is slightly above the conventional 0.08 threshold (Hu & Bentler, 1999; Henseler et al., 2016). Model fit is therefore regarded as marginal rather than fully

satisfactory, and the structural results should be interpreted with caution. Because PLS-SEM prioritizes the explanation and prediction of endogenous constructs over covariance-based model fit (Hair, Risher, et al., 2019), the interpretation in this study relies mainly on R square, effect sizes, and bootstrapped path significance rather than on SRMR alone.

Table 7 reports the specific indirect effects used to test whether local market price response mediates the relationship between the exogenous shocks and consumption pattern change. None of the three indirect paths, from income shock, asset damage, or aid effectiveness through local market price response to consumption pattern change, reached statistical significance (all $p > 0.85$). This result indicates that local market price response does not function as a mediator in this model; the influence of income shock on consumption pattern change operates through a direct channel rather than through the local market price mechanism.

Discussion

The main contribution of this study is to show, within a single integrated structural model, that an income-based shock can dominate a price-based shock as a driver of post-flood consumption change even when both shocks originate from the same flood event. The finding that income shock is the dominant, and in fact the only significant, predictor of both local market price response and household consumption pattern change is highly consistent with recent disaster-economics evidence (Cappelli et al., 2021). Agarwal et al., (2024) similarly found, using transaction-level data from the Chennai flood, that disaster-driven consumption decline was transmitted mainly through income shocks rather than through price shocks, a pattern that mirrors the present result in which local market price response failed to significantly affect consumption change even though income shock strongly predicted that same price response. Likewise, Wang & Zhao, (2023) showed that natural disasters widen expenditure inequality primarily because income-constrained households lack the buffers needed to protect their consumption, reinforcing the centrality of the income channel documented here.

The strong and direct link between income shock and consumption pattern change also fits comfortably within scarcity-mindset theory (Gupta & Mukherjee, 2024). When income collapses abruptly, coastal households appear to reallocate their budget toward essential, functional goods almost automatically, regardless of how local prices are moving, a tunneling-like response consistent with the asymmetric scarcity effects reported by Cheng et al., (2023) and with the anxiety-driven defensive purchasing documented by Omar et al., (2021) during the COVID-19 pandemic. In both settings, the psychological pressure of resource scarcity, rather than the objective price level in the market, appears to be what most directly reshapes purchasing priorities.

The non-significant effect of productive asset damage on local market price response may reflect a time-lag mechanism rather than a genuinely negligible relationship. Karki et al., (2022) observed in Nepal that the consequences of asset loss for household livelihoods and consumption tend to unfold gradually over months or years

as households attempt, and often struggle, to rebuild productive capacity, rather than manifesting immediately within the emergency and short-term recovery window captured by a single retrospective survey. It is therefore plausible that the effect of asset damage on this coastal sample would become detectable only in a longer-horizon or panel design that follows households well beyond the immediate post-flood period (Batmanathan et al., 2025).

Similarly, the absence of a significant effect of aid effectiveness on either local market price response or consumption pattern change is consistent with the character of most post-disaster assistance in Indonesia, which tends to be concentrated on short-term emergency relief, such as food packages, clean water, and temporary shelter, rather than on restoring household income or productive capacity. Deryugina, (2022) emphasizes that well-designed disaster policy requires a portfolio of instruments extending well beyond immediate relief, including protective infrastructure and income-support mechanisms; the null result found here suggests that emergency-oriented aid alone may be insufficient to meaningfully alter the trajectory of household consumption recovery.

The lack of a significant relationship between local market price response and consumption pattern change, together with the absence of any significant mediation, is arguably the most theoretically interesting result of this study. Product and price scarcity research by Barton et al., (2022) and the meta-analysis of Ladeira et al., (2023) suggest that scarcity cues generally do influence purchase decisions, yet the present findings imply that, once a household's income has already collapsed, further movement in local prices adds comparatively little additional explanatory power over consumption behavior; the household's spending has, in effect, already been compressed to essentials by the income shock itself.

These results are also broadly consistent with evidence from Indonesia and comparable fishing communities. Bestari & Noor, (2022) found that household income was the primary correlate of consumption pattern change during the COVID-19 pandemic in an urban Indonesian setting, while Nisa & Lukitawati, (2026) described multidimensional livelihood vulnerability, including sudden shocks and seasonal income fluctuation, among small-scale fishing households in Tambak Lorok, Semarang, and Fiorella et al., (2021) reported that small-scale fishing and fish-trading households around Lake Victoria, Kenya, reduced their fishing and trading activity under a sudden shock, an income vulnerability that is relevant to the occupational composition of the Langsa sample in this study, where fish traders, aquaculture pond owners, and fishers together made up more than half of all respondents.

It is also worth noting that the SRMR of 0.089 slightly exceeds the conventional 0.08 threshold, so model fit should be regarded as marginal and the non-significant paths in particular should be interpreted with caution. A possible contributing factor is the measurement noise inherent to self-reported, Likert-scale recollection of pre-flood and post-flood conditions, although this explanation is tentative and model misspecification cannot be ruled out. Future studies could reduce this noise by pairing self-reported indicators with objective transaction or expenditure records, following the approach used

by Agarwal et al., (2024) in their analysis of the Chennai flood, where financial transaction data allowed consumption changes to be measured directly rather than through respondent recall.

The novelty of these findings becomes clearer when they are set against studies published over the past five years. Agarwal et al. (2024) separated income shocks from price shocks after the Chennai flood using individual-level financial and supermarket sales records, but they concentrated on the size of the consumption drop and on how households smoothed it with credit and wealth, not on asset damage or post-disaster aid. Wang & Zhao (2023) showed with household panel data that natural disasters widen income and expenditure inequality in China, yet their focus was on inequality outcomes rather than on the channels through which a disaster reshapes household spending. Karki et al. (2022) and Pham & Saizen (2023) examined livelihood recovery and adaptation among disaster-affected households through, respectively, a qualitative study in Nepal and a household survey of coastal fishers in Vietnam, but neither estimated how such livelihood conditions translate into changes in consumption. In Indonesia, Bestari & Noor (2022) described household consumption change during the COVID-19 pandemic using cross-tabulation, while Nisa & Lukitawati (2026) analyzed the livelihood vulnerability of fishing households qualitatively, so that neither study tested a structural relationship. Against this background, the present study contributes by estimating income shock, productive asset damage, aid effectiveness, and local market price response simultaneously in a single PLS-SEM model of post-flood consumption pattern change among coastal households in an Indonesian small city, and it shows that only the income channel is statistically significant while the local price channel does not mediate.

Theoretical Implications

From a theoretical standpoint, this study contributes to the crisis consumer behavior and scarcity mindset literature by demonstrating, within a single integrated structural model, that an income-based shock can dominate a price-based shock as a driver of consumption change even when both shocks originate from the same disaster event. This finding extends the work into a coastal, small-city setting in a developing economy, a context that differs considerably from the urban and often higher-income settings in which much of the existing scarcity and disaster-consumption literature has been developed. Because the income channel identified here rests on livelihoods that depend on fishing, aquaculture, and small-scale trading, the findings are potentially applicable to other flood-prone coastal regions with similar livelihood structures, such as the Vietnamese and Malaysian coastal settings examined by Pham & Saizen (2023) and Batmanathan et al. (2025), although this applicability should be tested empirically. It also refines the crisis marketing framework by showing that, once income has collapsed, market-level price signals may carry comparatively little additional weight in shaping consumption decisions, a nuance that is easily overlooked when income and price shocks are studied separately rather than jointly.

Practical Implications

From a practical standpoint, the results carry direct implications for at least three groups of stakeholders. For the Langsa City Government, the dominance of the income channel implies that post-flood recovery budgets would likely generate a greater consumption-stabilizing effect if reallocated toward income-restoring instruments, such as cash-for-work programs in market and infrastructure rehabilitation, temporary wage subsidies for affected micro-enterprise workers, and low-interest working-capital loans for fish traders and pond owners, rather than being concentrated solely on in-kind emergency relief, in line with evidence that restoring livelihoods should remain a priority in post-disaster recovery (Karki et al., 2022) and that effective disaster policy needs income-support instruments beyond immediate relief (Deryugina, 2022). Recent evidence points in the same direction: flood-affected households in India maintained their consumption mainly through transfers, borrowing, and relief while livelihood losses went uncompensated (Senapati, 2024), and flood exposure in rural Pakistan reduced income diversification, leaving labor mobility and access to capital as the key policy entry points (Eskander & Fankhauser, 2022). For retail and MSME actors operating in flood-prone coastal markets, the findings suggest that adaptive stock management should be triggered by observed or anticipated income disruption in the surrounding community rather than by local price movements alone, since price signals in this study proved to be a comparatively weak predictor of the ensuing shift in household spending, particularly for staple foods, whose supply is easily disrupted when floods sever logistics routes (Rojas-Reyes et al., 2024), a concern that also appears in evidence that restricted product availability shapes consumer purchase decisions (Ladeira et al., 2023) and that disasters undermine food security among vulnerable groups (Basyigit et al., 2025). For disaster management agencies such as BPBD, the non-significant effect of current aid effectiveness on consumption pattern change suggests a need to evaluate whether existing aid packages are calibrated toward restoring income-generating capacity, for example through the replacement of small fishing and aquaculture equipment, rather than toward short-term consumable relief alone, which is consistent with recent work on the livelihood adaptation strategies of coastal fishers and communities facing extreme events (Pham & Saizen, 2023; Mutanda & Nhamo, 2026).

Limitations and Future Research

This study is subject to several limitations that should be considered when interpreting its findings. First, the cross-sectional design combined with a structured recall method means that pre-flood and post-flood conditions were reported retrospectively by the same respondents at a single point in time, which may be subject to recall bias, particularly for households further removed in time from the flood event. Second, the sample was drawn exclusively from coastal sub-districts of a single city, Langsa, which limits the generalizability of the findings to other coastal or flood-prone regions with different livelihood structures, market configurations, or disaster histories. Third, the model's R square values, at 0.204 and 0.324 for consumption pattern change

and local market price response respectively, indicate that a substantial share of variance remains unexplained, suggesting that other factors not modeled here, such as household savings, informal credit access, social capital, and remittances, likely also play an important role in shaping post-disaster consumption behavior. Fourth, the SRMR of 0.089 slightly exceeded the conventional 0.08 threshold, indicating marginal model fit, so the non-significant paths in particular should be interpreted with caution.

CONCLUSION

This study examined how income shock, productive asset damage, and post-disaster aid effectiveness shape household consumption pattern change, both directly and through the mediating role of local market price response, among 158 flood-affected coastal households in Langsa City. Using PLS-SEM, the measurement model demonstrated adequate convergent and discriminant validity, while the structural model revealed that income shock was the only construct with a significant effect, exerting a strong positive influence on both local market price response and household consumption pattern change, whereas productive asset damage, aid effectiveness, and local market price response itself showed no significant effect, and local market price response did not mediate any of the tested relationships. These findings indicate that income loss, rather than asset destruction, aid distribution, or price movement, is the dominant mechanism driving post-flood consumption adjustment among coastal households, and they suggest that market recovery policy should prioritize rapid income restoration over price-stabilization or short-term relief measures alone. This study is limited by its cross-sectional, single-city design, marginal model fit (SRMR = 0.089), and its reliance on a structured recall method, which may not fully capture the longer-term dynamics of asset-based recovery; future research would benefit from panel data collection across multiple post-disaster periods and from extending the model to additional coastal regions with recurring flood exposure.

ACKNOWLEDGEMENTS

This research was funded by the Lembaga Penelitian dan Pengabdian kepada Masyarakat (LPPM) Universitas Samudra under grant number 732/DST/UN54.6/PT.01.03/2026. The authors gratefully acknowledge the financial support provided throughout the research process.

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