



Revealing the Role of Livelihood Strategies in Shaping Multidimensional Poverty Dynamic: Evidence from Rural Indonesia

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ABSTRACT

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Poverty alleviation represents a significant global challenge, particularly for developing countries. This issue was recognized as the primary Sustainable Development Goal in 2015. Poverty is a complex, multidimensional phenomenon that cannot be adequately measured by a single indicator. Households frequently transition in and out of multidimensional poverty due to various factors, including household livelihood strategies. This study aims to explore the dynamics of multidimensional poverty and livelihood strategies in rural Indonesia, analyze their relationship through the lens of the Sustainable Livelihood Approach. Utilizing panel data from the Indonesian Family Life Survey covering 4,593 households across 2007 and 2014, the research applies the Alkire-Foster method to assess multidimensional poverty status and employs cluster analysis to classify livelihood strategies. The findings reveal that among the 23.88% of households identified as multidimensionally poor in 2007, 8.67% stayed poor in 2014, while 15.22% successfully transitioned out of poverty. Conversely, 4.29% of households moved into poverty. Living standard was the most significant dimension, while years of schooling was the largest indicator to multidimensional poverty in rural Indonesia. Notably, 54.63% of households retained their initial livelihood strategies, while 45.37% of households adapted to changing conditions and opportunities. Wage labor and business and self-employment constituted the predominant livelihood strategy, although their ranking has been reversed over the two periods. Agricultural livelihood strategies in 2007 were identified as a significant determinant of households' ability to escape poverty, besides other age and working status of the household head factors. However, these households also faced higher risks of stay poor compared to other strategies. These findings suggest policy implications for improving the range of livelihood choices available to households to move out of the poverty trap.

1. INTRODUCTION

Poverty remains a pervasive challenge globally, particularly in developing nations. Alleviating poverty is a core goal of the international development agenda [1, 2] and its success is a prerequisite for achieving the other SDGs [3-5]. Poverty is closely associated with various issues, including livelihoods [6], vulnerability, dependence, isolation, powerlessness [7], well-being [8, 9], economy [10-12], resilience [13], and others. In low-and middle-income countries (LMICs), households experiencing severe or marginal poverty face heightened risks of falling back into poverty due to fragile socio-economic foundations [14, 15].

In Indonesia, poverty remains a persistent development challenge and has long been positioned as a national priority, as reflected in the 2020-2024 National Medium-Term Development Plan. Recent data indicate a decline in poverty rates, from 9.36% in March 2023 to 9.03% in March 2024 [16]. However, a significant portion of the population remains vulnerable. The bottom 40% of Indonesian households have a

one-in-ten likelihood of transitioning from non-poverty to poverty within a year [17]. This underscores the dynamic nature of poverty, characterized by households oscillating between poverty and non-poverty statuses while others remain entrenched in chronic poverty [18, 19]. In other hand, significant proportion of the impoverished population resides in rural areas, with 13.58 million people (11.79%) living below the poverty line, compared to 11.64 million individuals (7.09%) in urban settings [20]. This poverty dynamic and substantial rural-urban disparity highlights the urgency of a deeper understanding of rural poverty as a critical pathway to achieving broader national poverty reduction goals.

In response to growing recognition of poverty's complexity, the academic discourse has shifted from income-centric definitions to multidimensional frameworks, inspired by Sen's capability approach [21]. These frameworks capture deprivations across various dimensions, such as education, health, and living standards, offering a more holistic assessment of well-being. Instruments like the Multidimensional Poverty Index (MPI) and the Alkire-Foster

method have been widely adopted to assess the scope and severity of multidimensional poverty globally [22]. However, most applications remain cross-sectional, limiting their utility for understanding the dynamics of poverty over time.

A parallel shift in poverty research emphasizes the importance of dynamic analyses—examining poverty transitions, persistence, and exits—to inform more responsive policy interventions [23, 24]. However, existing studies primarily focus on income-based poverty dynamics, with relatively fewer investigations into multidimensional poverty dynamics. In the developing countries context (including Indonesia), longitudinal research on multidimensional poverty remains sparse due to limited panel data availability [25, 26].

Poverty is influenced by a multitude of factors, among which livelihood strategies play a pivotal role, both directly and indirectly [6, 27]. Livelihood strategies refer to the means by which households generate income and maintain welfare [28]. The Sustainable Livelihood Framework (SLA) provides a theoretical basis for understanding how livelihood strategies influence poverty. Empirical evidence shows that households that possess diversified and well-managed livelihood strategies are more likely to maintain their income and avoid poverty [29-31].

Although the relationship between livelihood strategies and poverty has gained increasing scholarly attention, empirical evidence on this nexus remains limited, particularly in the context of rural Indonesia. Much of the existing research has relied on cross-sectional designs [32, 33], which capture only static associations [6, 29] and therefore constrain the analysis of poverty and livelihood dynamics over time. The use of panel data remains rare, largely due to data scarcity and the complexity of incorporating multiple variables that adequately reflect household characteristics. Furthermore, many previous studies have focused on specific regions with relatively small samples [32, 34, 35], limiting the generalizability of their findings. Another important limitation lies in the predominant reliance on monetary measures of poverty, which neglects its multidimensional character.

To address these methodological and empirical gaps, this study advances four key contributions. First, it employs longitudinal data to capture the dynamic interplay between

livelihood strategies and multidimensional poverty. Second, it draws on a relatively large sample, enhancing the representativeness of rural households across Indonesia. Third, it operationalizes poverty through a multidimensional framework, thereby complementing and extending beyond conventional monetary-based approaches. Fourth, it proposes a unified analytical framework that integrates livelihood strategies and multidimensional poverty dynamics, and provides a more comprehensive perspective in rural Indonesia.

This research aims to answer: (a) How are the dynamics of multidimensional poverty over time? (b) How do livelihood strategies exhibit mobility? (c) What roles do livelihood strategies play in shaping multidimensional poverty dynamics?

2. LITERATURE REVIEW

Figure 1 presents a conceptual framework illustrating the relationship between multidimensional poverty dynamics and household livelihood strategies. Over time, households may transition in and out of multidimensional poverty or maintain their poverty status. These transitions are influenced by the livelihood strategies adopted by households, which may involve shifting between strategies or remaining within a single strategy.

The framework emphasizes two critical components: livelihood strategies and livelihood outcomes. The choice of livelihood strategy is shaped by household asset ownership and geographic location [36-38]. Additionally, previous livelihood outcomes, which influence investments and savings, directly impact asset accumulation and utilization in subsequent periods [27]. Related to livelihood strategies, activity variables serve as a crucial link between household assets and the income streams generated from these assets. Households employ a range of assets—financial, physical, human, natural, and social—to sustain their livelihoods [39-41]. To classify livelihood strategy groups, this study incorporates variables such as wage employment, business and self-employment, wage income per capita, total income per capita, working hours, and agricultural income share.

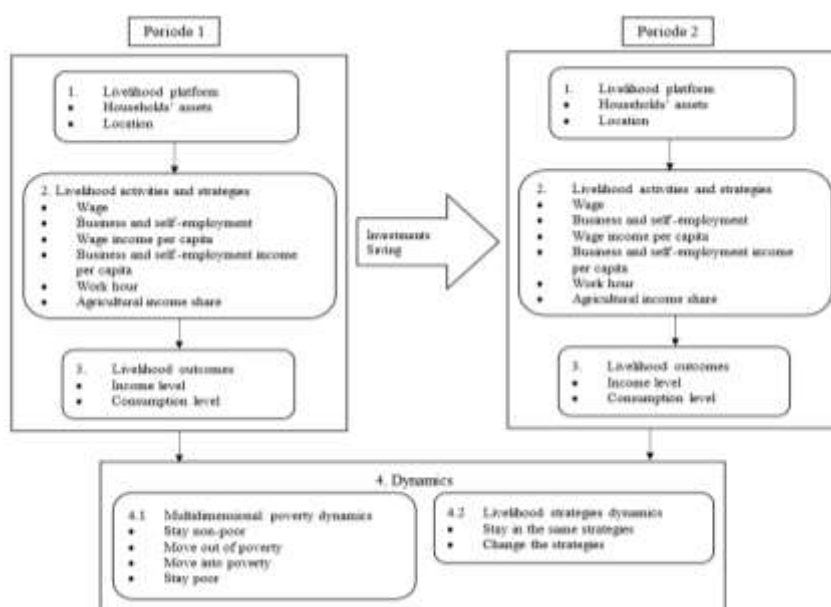


Figure 1. Framework for multidimensional poverty dynamics and livelihood strategies

Source: [6, 28, 42-44]

The outcomes of adopted livelihood strategies significantly influence household welfare, as reflected in income and consumption patterns [28, 42, 45]. Changes in income levels resulting from these strategies directly impact multidimensional poverty dynamics. Specifically, shifts in livelihood strategies can lead to variations in poverty levels, either alleviating or exacerbating deprivation [6, 27, 43, 46]. This framework underscores the dynamic interplay between livelihood strategies and livelihood outcomes, providing a comprehensive lens for analyzing household multidimensional poverty dynamic.

This study hypothesizes that livelihood strategies affect multidimensional poverty dynamics through several mechanisms. First, agricultural households often face higher levels of multidimensional poverty due to their dependence on natural resources, vulnerability to environmental risks, and market fluctuations. On the other hand, agricultural intensification and diversification can improve income and offer opportunities for poverty exit. Second, wage labor strategy can impact multidimensional poverty dynamics by providing a stable income source, reducing economic vulnerability, and increasing assets. Third, business and self-employment strategies are expected to shape multidimensional poverty dynamics by diversifying income sources, providing earning opportunities through employment, and creating socioeconomic value. These hypothesized pathways provide a framework to interpret empirical findings within the Sustainable Livelihoods Approach.

3. MATERIAL AND METHODS

3.1 Data collection

This study utilizes panel data from the Indonesian Family Life Survey (IFLS), specifically Wave 4 (2007/2008) and Wave 5 (2014/2015), to examine the dynamics of multidimensional poverty and household livelihood strategies in rural Indonesia. The unit of analysis is the household, given its centrality in livelihood analysis and socio-economic research [47]. A total of 4,593 rural households consistently surveyed across both waves were selected based on data completeness and relevance to the study objectives.

Prior to analysis, the dataset underwent rigorous cleaning procedures. Missing values were handled using multiple imputation for socio-demographic variables, while households with systematically incomplete records on key variables (e.g., poverty indicators, livelihood activities), across all waves were excluded to minimize bias. Attrition analysis indicated that households lost to follow-up were not systematically different from those retained in terms of baseline poverty status and livelihood profiles, reducing concerns of selective attrition bias. These steps ensured the validity and reliability of the panel dataset used for subsequent econometric analysis.

IFLS is the most extensive and reliable longitudinal dataset available for Indonesia, tracking the same households and individuals over time, thus enabling robust analysis of socio-economic transitions and behavioral dynamics [48]. The survey captures a wide range of variables across multiple domains, including demographics, health, education, employment, income, and consumption. Data were collected using structured questionnaires administered through face-to-face interviews by trained enumerators. The survey design also includes modules targeting community-level services such as

health and education facilities. All respondents provided written informed consent prior to participation. To ensure transparency and reproducibility of the research, IFLS data and instruments are publicly accessible through the RAND Corporation website (<https://www.rand.org/well-being/social-and-behavioral-policy/data/FLS/IFLS/access.html>).

3.2 Data analysis

3.2.1 Multidimensional poverty measurement

This study employs the Alkire–Foster (A-F) methodology to construct a composite index of multidimensional poverty, grounded in Sen’s capability approach [49, 50]. This method emphasizes the normative importance of selecting functions and capabilities that reflect socially valued capabilities. The A–F framework is also consistent with the multidimensional focus of global development agendas such as the Millennium Development Goals [49].

The Alkire–Foster method applies a dual-cutoff strategy to identify multidimensional poverty. First, households are evaluated against deprivation thresholds for each indicator, classifying them as deprived or non-deprived based on context-specific benchmarks. This study employs eleven nationally relevant indicators, as summarized in Table 1. Deprivation scores are then aggregated using predetermined weights, and a second cutoff (0.333) is applied to determine multidimensional poverty status. The resulting MPI (Mo) is calculated as the product of the headcount ratio (H) and poverty intensity (A) [51]. Mathematically, these are defined as:

$$H = \frac{q}{n} \quad (1)$$

$$A = \frac{\sum_{i=1}^q c_i(k)}{q} \quad (2)$$

$$Mo = H \times A = \frac{q}{n} \times \frac{\sum_{i=1}^q c_i(k)}{q} = \frac{1}{n} \sum_{i=1}^q c_i(k) \quad (3)$$

where, n represents the sample size, q denotes the number of multidimensionally poor individuals, c_i represents the deprivation scores of each individual i , and k is a poverty threshold. Individuals with $c_i \geq k$ are classified as poor; otherwise, $c_i(k)$ is assigned a value of zero. The index is highly decomposable, enabling disaggregation across population subgroups and indicators [21, 52].

To test the robustness of the poverty analysis, we used different thresholds to determine poverty. To ascertain whether households were multidimensionally poor or not, we set thresholds of 0.3 and 0.4 and tracked the effect on the outcomes.

Poverty dynamics reflect the temporal shifts in household or individual welfare status, specifically transitions between poverty and non-poverty over time [53, 54]. Two main analytical frameworks are frequently employed: the component approach, which uses longitudinal averages (e.g., income) to detect chronic deprivation, and the spell approach, which tracks the frequency of households experiencing poverty [55]. These methods enable the categorization of poverty as chronic, transitory, or non-existent [56].

Table 1. Dimensions and indicators of multidimensional poverty

No.	Dimensions	Indicator	The Household is Deprived if the Specific Condition Is Met	Weight
1	Health	Nutrition	Any members under the age of 70 are malnourished. Adults (age $\geq$ 20 years) have a BMI $<$ 18.5; ages 5-19 have an age-appropriate BMI $<$ WHO standard. Toddlers (aged $\leq$ 5 years) have a z-score $>$ -2 SD.	1/6
		Child death rates	Any child under 18 has died within the past five years.	1/6
2	Education	Years of education	No household member has completed at least nine years of formal education (junior high school).	1/6
		Attendance at school	Any child aged 7-15 is not enrolled in school.	1/6
3	Living Standards	Fuel for cooking	The domestic cooks using charcoal, wood, or manure.	1/18
		Sanitation	The household shares a sanitary facility with other households or lacks one altogether.	1/18
		Drinking water	Proper drinking water sources, such as wells, uncovered springs, rivers, rainwater, and ponds, are not available to the household.	1/18
		Electricity	There is no electricity in the house.	1/18
		Housing	Housing is constructed with substandard materials for flooring, walls, or roofing.	1/18
		Assets	The household lacks ownership of essential assets: a car or truck, a motorbike, a radio, TV, phone, bicycle, or refrigerator.	1/18

Table 2. Livelihood activity variables

No.	Livelihood Activities Variables	Definition	Scale
1	Wage	Ownership of household income derived from wage-earning activities	0 = no 1 = has
2	Business and self-employment	Ownership of household income derived from business and entrepreneurial activities	0 = no 1 = has
3	Wage income per capita	Total wage income (both cash and subsistence) per capita (in IDR)	Continuous
4	Business and self-employment income per capita	Total business and entrepreneurial income per capita (in IDR)	Continuous
5	Work hour	Total working hours (hours)	Continuous
6	Agricultural income share	Proportion of household income from agriculture (%)	Continuous

This study employs the spell approach due to its operational simplicity and capacity to reflect temporal variations in household conditions [57, 58]. Notably, this method is well-suited for integration with non-income-based poverty measures such as the MPI, providing a more holistic understanding of household welfare trajectories [19, 59-61]. Adapting established models to the Indonesian context [19, 59, 62], this study identifies four categories of multidimensional poverty transitions. The initial category, designated as "stay poor," pertains to households that persist in experiencing multidimensional poverty throughout both periods. The subsequent category, "move out of poverty," pertains to households that undergo a transition from multidimensional poverty. The third category is "move into poverty," which refers to households that fall into multidimensional poverty. The fourth category, designated as "never poor," signifies households that maintain non-poor status throughout both periods.

3.2.2 Livelihood strategies measurement

The classification of households into distinct livelihood strategy groups involves a two-step process. First, relevant variables influencing household livelihood choices must be identified. This study adopts activity choice framework [63], which conceptualizes livelihood strategies as the combination of income-generating activities pursued to sustain or enhance well-being. Accordingly, six variables were chosen to reflect both the type and intensity of these activities to classify livelihood strategies, as shown in Table 2. Those variables were selected because they represent the main livelihood domains in the study area (wage, business and self-employment, working hours, and agricultural income share).

They also align with prior literature on livelihood classification [27, 64-66], ensuring methodological robustness.

Specifically, the inclusion of "work hour" captures the intensity of labor input, reflecting their capacity to engage in income-generating activities. Modified from Jiao et al. [27], it was scaled as total weekly hours of working household members. Similarly, "agricultural income share" indicates the degree of dependence on agriculture, which serves as both a potential pathway out of poverty and a source of vulnerability. Adapted from previous studies [65, 66], it was measured as the agriculture percentage of total income to reflect sectoral dependence.

Second, an appropriate statistical method is applied to cluster households based on these variables. Households were grouped using the K-means clustering algorithm, which partitions observations to minimize intra-group variance and maximize inter-group differentiation. The Calinski-Harabasz pseudo-F index and Duda-Hart index were used to determine the optimal number of clusters, both of which supported a three-cluster solution as the most appropriate classification scheme. For robustness check, we also employed alternative clustering method (Ward's hierarchical clustering) to ensure consistent results. Unlike other statistical methods for classification, such as discriminant analysis, cluster analysis makes no prior assumption about important differences within a population. Cluster analysis is a purely empiric method of classification and as such is primarily an inductive approach [67].

3.2.3 Multinomial logit regression model

To investigate the influence of livelihood strategies on multidimensional poverty dynamics, this study employed

multinomial logit regression model (MLM). This model is appropriate for analyzing dependent variables that have more than two unordered outcomes [68]. MLM determines the factors that affect a household's multidimensional poverty dynamics based on livelihood strategy 2014, former year's (2007) livelihood strategy, and selected control variables (household size, age, marital status, education, working status, and island). By integrating these controls, the study ensures that findings are not solely driven by livelihood strategies but also consider broader socio-demographic and spatial influences. This approach strengthens the policy applicability of the results, making them relevant for poverty alleviation. The MLM is defined as follows:

$$P_{ij} = \frac{\exp(X_j' \beta_j)}{\sum_{j=1}^m \exp(X_j' \beta_j)} \quad (4)$$

j=1 ..., m

where, P_{ij} represents the possibility of household i multidimensional poverty dynamics j out of m status, X_i' represents factors that influence household multidimensional poverty dynamics including livelihood strategies. β_j was set to zero for the forth multidimensional poverty dynamics and thus coefficients were interpreted with respect to this reference category.

To ensure the validity of MLM, multicollinearity tests was conducted to evaluate key assumptions. Multicollinearity was assessed using the Variance Inflation Factor (VIF), with VIF values below 5 indicating no multi-collinearity problems among explanatory variables.

4. RESULT AND DISCUSSION

4.1 Overview of multidimensional poverty dynamic

Table 3 illustrates a notable decline in multidimensional poverty among rural households in Indonesia over the study period. The multidimensional headcount ratio (H) fell significantly from 21.79% in 2007 to 10.66% in 2014, while the average deprivation intensity (A) among the poor also declined modestly from 41.57% to 40.30%. Consequently, the adjusted multidimensional poverty index (M_0) decreased from 9.06% to 4.29%, indicating substantial progress in reducing both the incidence and severity of poverty. Robustness tests, including sensitivity tests for poverty thresholds ($k = 0.3$ and $k = 0.4$), yielded consistent results ($\pm 5\%$ variation in poverty rates).

Table 3. Multidimensional poverty in rural Indonesia

Indices	2007	2014
Headcount index (H)	0.2179259	0.1066039
Intensity of deprivations (A)	0.4157377	0.4030217
Adjusted headcount ratio (M_0)	0.0906	0.0429637

Although this downward trend aligns with previous studies, the rate of decline differs from findings by Najitama et al. [19] and the Oxford Poverty and Human Development Initiative (OPHI). For example, OPHI reported a reduction in H from 15.5% in 2012 to 3.6% in 2017. These variations may stem from differences in sampling frames and indicator selection—particularly OPHI's exclusion of nutritional indicators due to data limitations. Nonetheless, the consistent direction of

change across studies highlights the effectiveness of Indonesia's poverty reduction strategies.

Table 4 presents the dynamics of multidimensional. Of the households classified as multidimensionally poor in 2007 (23.88%), 8.67% stayed poor in 2014, while 15.22% moved out of poverty. Conversely, 4.29% of initially non-poor households moved into poverty by 2014, emerging vulnerability within the rural population.

Table 4. Multidimensional poverty dynamic

2007 to 2014			
Multidimensional Poverty Status	Poor	Not Poor	Total
Poor	398 (8.67%)	699 (15.22%)	1.097 (23.88%)
Not Poor	197 (4.29%)	3.299 (71.83%)	3.496 (76.12 %)
Total	595 (12.95%)	3.998 (87.05%)	4.593 (100.00%)

4.2 Multidimensional poverty decomposition

Figure 2 highlights that living standard remains the most significant contributor to multidimensional poverty in both IFLS 4 (2007) and IFLS 5 (2014). This dimension is followed by education and health, which served as the secondary drivers of poverty in 2007 and 2014, respectively.

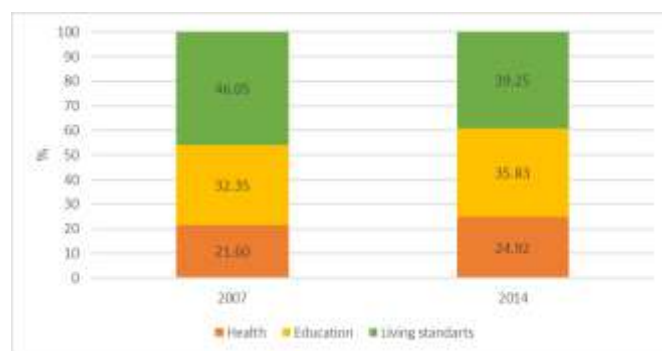


Figure 2. Contribution of multidimensional poverty dimensions over years

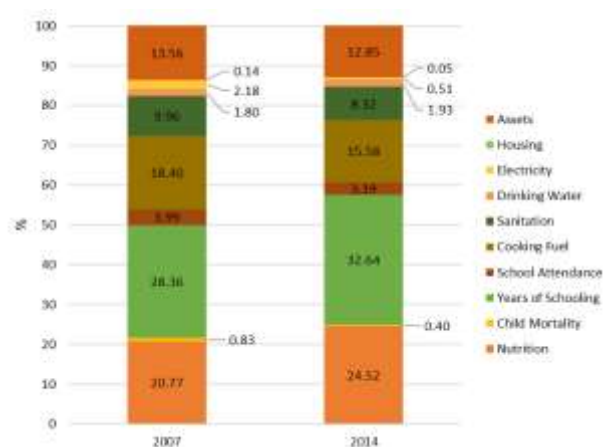


Figure 3. Contribution of multidimensional poverty indicators over years

As shown in Figure 3, the years of schooling indicator emerged as the dominant contributor to rural multidimensional

poverty in both survey waves, accounting for 28.36% in 2007 and 32.64% in 2014. This was followed by nutrition, contributing 20.77% and 24.52%, and cooking fuel, contributing 18.40% and 15.58% in 2007 and 2014, respectively. The persistence of these three indicators as leading sources of deprivation underscores the structural barriers to education, nutrition, and energy access in rural Indonesia.

4.3 Household livelihood strategies and their dynamic

Cluster analysis identified three distinct livelihood strategies, each representing the predominant income-generating activities among rural households. For robustness test, alternative clustering methods (hierarchical Ward's linkage) confirmed the three-strategy typology, with silhouette scores > 0.6 validating cluster quality. Table 5 summarizes the key activity variables that characterize these clusters. Households were assigned to a single strategy type for both 2007 and 2014, based on dominant activity variables.

The first cluster, labeled “business and self-employment,” comprised households with the highest levels of per capita income derived from entrepreneurial activities. The second cluster, referred to as “agricultural households,” was dominated by income from agricultural activities. The third cluster, “wage labor,” was distinguished by longer working hours and higher per capita income from wage-based employment relative to the other groups.

4.4 Transitions in livelihood strategy

Table 6 presents the transitions of household livelihood strategies in rural Indonesia between 2007 and 2014. In 2007, wage labor was the dominant strategy, accounting for 36.53% of households. By 2014, there was a substantial increase in households engaged in business and self-employment, which emerged as the predominant strategy (45.79%), surpassing wage labor (36.51%). Meanwhile, the share of agricultural

households declined from 27.30% to 17.70%, indicating a marked retreat from agriculture as a primary livelihood source.

Over the seven-year period, 54.63% of households maintained their original livelihood strategy, while 45.37% shifted to alternative strategies, reflecting high livelihood mobility. As depicted in Figure 4, the most frequent transition involved a shift toward business and self-employment, adopted by 22.53% of households—12.85% of which transitioned from wage labor. Simultaneously, 16.24% exited wage employment, with the majority shifting into business and self-employment. While 6.51% adopted agriculture-based strategies, a larger share—16.11%—moved out of agriculture entirely.

These findings underscore the adaptive and fluid nature of rural livelihood strategies, shaped by shifting socio-economic contexts, opportunities, and constraints. They also highlight the growing prominence of business and self-employment as a preferred livelihood pathway among rural Indonesian households.

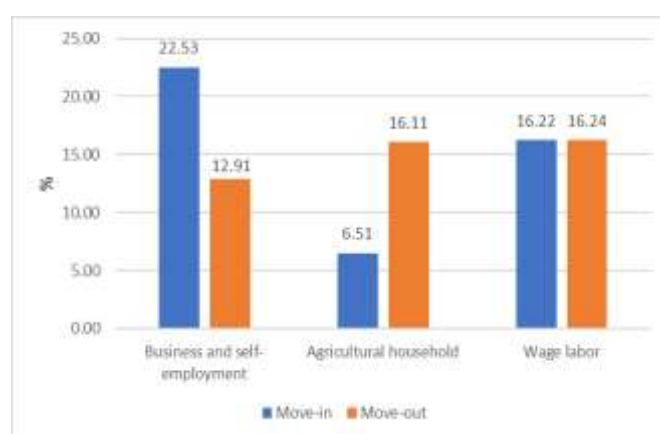


Figure 4. Transitions between livelihood strategies by percentage of households

Table 5. Livelihood strategies and activity values

Livelihood Strategies	Business and Self-Employment	Agricultural-Household	Wage-Labor	Total
Wage (proportion)				
0. No	1.00	0.72	0.00	0.59
1. Has	0.00	0.28	1.00	0.41
Business and self-employment (proportion)				
0. No	0.39	0.00	0.67	0.42
1. Has	0.61	1.00	0.33	0.58
Wage income per capita (mean)	132377.79	377452.10	2271487.95	956791.71
Business and self-employment income per capita (mean)	2092575.67	1010739.28	1195298.25	1573466.76
Work hour (mean)	104.09	153.78	161.09	133.69
Agricultural income share (mean)	0.01	0.84	0.08	0.18

Table 6. Matrix of livelihood strategies transition (number and % of total households in parentheses)

Livelihood Strategies	Business and Self-Employment		Agricultural Household		Wage-Labor		Total for 2007		Move-out	
	(2014)		(2014)		(2014)					
Business and self-employment (2007)	1,068	(23.25)	143	(3.11)	450	(9.80)	1,661	(36.16)	593	(12.91)
Agricultural household (2007)	445	(9.69)	514	(11.19)	295	(6.42)	1,254	(27.30)	740	(16.11)
Wage-labor (2007)	590	(12.85)	156	(3.40)	932	(20.29)	1,678	(36.54)	746	(16.24)
Total for 2014	2,103	(45.79)	813	(17.70)	1,677	(36.51)	4,593	(100.00)		
Move-in	1,035	(22.53)	299	(6.51)	745	(16.22)				

4.5 Determinants of multidimensional poverty dynamics

Table 7 presents the results of a multinomial logistic regression examining the influence of livelihood strategies and selected control variables on multidimensional poverty dynamics. The model provides a comprehensive perspective on the determinants shaping transitions in poverty status with never poor as based category.

Table 7. Multinomial logit regression outputs (odds ratio)

Variables	Move out of Poverty	Move into Poverty	Stay Poor
Livelihood Strategies 2014			
Business and self-employment (Reference)			
Agricultural household	1.02	0.90	1.13
Wage labor	1.03	0.87	1.08
Livelihood Strategies 2007			
Business and self-employment (Reference)			
Agricultural household	1.52 ***	1.34	1.81 ***
Wage labor	0.95	1.25	1.08
Household size (n)	1.02	0.81	0.88 ***
Age of household head (years)	0.99 ***	1.01 *	1.02 ***
Marital status of the household head			
Unmarried (Reference)			
Married	0.69	0.64	0.31 ***
Ever-married	0.84	0.81	0.49
Education level of household head			
Under secondary school (Reference)			
Graduated from secondary school	0.31	0.18 ***	0.15
Graduated from high school and higher	0.19	0.07 ***	0.05 **
Working status of the household head			
Not work (Reference)			
Informal worker	0.89	1.31	1.18
Formal worker	0.75 *	1.12	0.76
Island			
Outside Java (Reference)			
Java	0.97	0.99 ***	0.81 *

Among the three livelihood strategies, only the agricultural household strategy in 2007 significantly influenced multidimensional poverty dynamics. Households engaged in agriculture were 1.52 times more likely to escape poverty. However, the same group also exhibited a 1.81 times higher likelihood of stay poor compared to those pursuing business or self-employment.

This paradoxical duality reflects theoretical tensions in the Sustainable Livelihood Approach. On the one hand, agricultural households have significant potential to exit poverty through increased productivity, access to resources, and effective policy interventions. Policies that support productivity growth, safeguard assets, and expand market access have been shown to significantly enhance the economic status of rural households [69, 70]. Access to micro-credit, education, participation in agricultural seminars, and livestock assets significantly increase the probability of households escaping chronic poverty [70]. Additionally, effective policy

interventions, such as the provision of agricultural credit and expansion of irrigation access, can reduce the adverse effects of climate variability and improve poverty status [71]. On the other hand, in the Indonesian context, agricultural households also face substantial risks of remaining poor due to heavy reliance on farming, susceptibility to environmental and economic shocks, and structural inequalities. Dependence on traditional methods and low-value crops exacerbates their economic fragility [72, 73], while exposure to environmental hazards—such as droughts, floods, and climate change—can devastate harvests and diminish income, often pushing households back into poverty [74, 75]. Economic shocks, including food price volatility, disproportionately erode their purchasing power [76]. Structural barriers, such as limited access to education, healthcare, and infrastructure, further constrain opportunities for upward mobility [77, 78]. Inadequate market access and poor infrastructure compound these challenges by limiting the ability of households to secure fair prices for their produce and to obtain essential services [70, 78].

Household size showed a negative and significant association with stay poor category. Larger households were less likely to remain in poverty, likely due to increased labor availability, which enhances income-generating capacity and mitigates deprivation across dimensions [79, 80]. However, this contrasts with other studies linking larger households to higher poverty risk [81, 82], indicating that the impact of household size may be context-dependent.

Age of the household head was positively correlated with the likelihood of move into or stay in poverty. Older heads were less likely to escape poverty, aligning with evidence that aging reduces income-generating capacity due to declining health or retirement [83, 84]. The result is different from studies that indicate poverty tends to decline with age only up to a threshold, after which vulnerability increases [85]. There is also evidence that age may not significantly affect multidimensional poverty [79].

Marital status also emerged as a significant determinant. Households headed by married individuals were less likely to remain poor, likely due to dual contributions in labor and household management, enhancing overall welfare [19, 86]. This finding aligns with previous research but contrasts with studies suggesting that marriage may increase economic burden and poverty risk [81].

Education level of the household head had a statistically significant and negative effect on poverty persistence. Higher educational attainment reduced the likelihood of staying poor or moving into multidimensional poverty, reinforcing prior findings that link education to greater resilience and upward mobility [12, 19, 87, 88].

Lastly, geographical location played a critical role. Households located on Java Island had significantly lower probabilities of staying poor or moving into poverty, owing to better access to services, infrastructure, and economic opportunities. This reinforces prior evidence that regional disparities—particularly between Java–Bali and other islands—are a key driver of poverty inequality in Indonesia [19, 89].

5. CONCLUSION

This study investigates the role of livelihood strategies in shaping multidimensional poverty dynamics in rural Indonesia,

utilizing the Sustainable Livelihood Approach (SLA) as the conceptual lens. Drawing on panel data from IFLS Waves 4 and 5, multidimensional poverty was measured using the Alkire–Foster method, while livelihood strategies were identified through cluster analysis and analyzed using multinomial logistic regression.

The findings reveal a significant decline in multidimensional poverty between 2007 and 2014. However, poverty transitions were not uniform: while a substantial share of households exited poverty, a notable portion remained trapped or fell into deprivation. Living standards consistently emerged as the primary contributor to multidimensional poverty, with years of schooling being the most influential indicator.

Three distinct livelihood strategies—business and self-employment, agriculture, and wage labor—were identified. Transitions in livelihood strategies were common, with a considerable shift toward business and self-employment, indicating household responsiveness to evolving socio-economic conditions. Although agricultural households showed some capacity to escape poverty, they also faced a higher risk of remaining poor, reflecting structural vulnerabilities in the rural economy.

In addition to livelihood strategies, socio-demographic factors significantly shaped poverty outcomes. Larger households were less likely to remain poor, while older household heads were more vulnerable to poverty persistence. Marital status and educational attainment of the household head were positively associated with poverty exit, underscoring the importance of social support and human capital. Moreover, geographic disparities persisted, with households in Java exhibiting lower poverty risks compared to those in other regions.

These findings highlight the need for targeted, context-sensitive policy interventions. Promoting livelihood diversification, enhancing rural infrastructure, improving access to education and health services, and addressing regional disparities are critical to breaking poverty cycles. Future research should incorporate additional social and environmental dimensions, along with spatial analysis, to provide a more comprehensive understanding of multidimensional poverty dynamics and inform inclusive, sustainable development strategies.

This study is limited to assessing multidimensional poverty through education, health, and living standards. Future research should incorporate additional dimensions, such as social and environmental factors, to provide a more holistic measure of multidimensional poverty. Additionally, spatial analysis should be included to capture regional disparities more comprehensively. Furthermore, potential measurement errors in poverty indicators and omitted variable biases—such as unobserved household shocks—remain areas for refinement in subsequent studies. Such expanded analyses would enhance the understanding of poverty dynamics and inform more effective, context-specific policy interventions.

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