

# From Devolution to Livelihood Empowerment: A Multilevel Mixed-Methods Study of Local Government Support in Apayao Province, Philippines

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| ARTICLE INFORMATION                                                                                                                                                                                      | ABSTRACT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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| <b>Article history:</b><br>Published: August 2026<br><br><b>Keywords:</b><br>Decentralization<br>Local Government<br>Livelihood Development<br>Economic Empowerment<br>Apayao<br>Multilevel Mixed Method | Decentralization gave local government units substantial responsibility for socioeconomic planning, service coordination, and livelihood promotion, yet the extent to which local support translated into economic empowerment depended on implementation quality. This study examined how accessibility and targeting, capability-building quality, market linkage, finance and input linkage, and follow-up and accountability were associated with the economic empowerment of livelihood participants in Apayao Province, Philippines. An explanatory sequential mixed-methods design involved 462 adults from 49 barangays across all seven municipalities. Thirty-two key informants and participants joined the qualitative phase. Two ordinal instruments underwent expert content review, pilot testing, confirmatory factor analysis, and reliability assessment. Descriptive statistics, three-level repeated-outcome analysis, population-averaged logistic analysis, and random-intercept linear mixed-effects regression were used. The overall Local Government Livelihood Support Index was favorable ( $M = 3.79$ , $SD = 0.58$ ), although market linkage received the lowest domain score ( $M = 3.51$ , $SD = 0.72$ ). Median monthly net livelihood income increased from PHP 5,400 to PHP 7,400 between entry and the 12-month review; the geometric mean ratio was 1.31 (95% CI [1.25, 1.38], $p < .001$ ). Regular saving increased from 36.4% to 58.2% ( $OR = 2.47$ , 95% CI [1.95, 3.14], $p < .001$ ). In the adjusted multilevel analysis, follow-up and accountability (standardized $b = 0.24$ ), market linkage ( $b = 0.21$ ), capability building ( $b = 0.18$ ), accessibility and targeting ( $b = 0.11$ ), and finance and input linkage ( $b = 0.09$ ) were positively associated with economic empowerment. Market and finance support had a complementary interaction ( $b = 0.10$ , Holm-adjusted $p = .006$ ). Interviews indicated that barangay outreach reduced entry barriers, coaching converted training into practice, coordinated buyers and finance strengthened enterprise decisions, and routine monitoring sustained implementation. Distance, transport cost, weak connectivity, and fragmented referral processes constrained the same pathways. The results supported a bundled local livelihood system in which access, skills, capital, markets, and aftercare were managed as connected functions. Because the study had no comparison group, changes over time were interpreted as participant outcomes rather than effects caused solely by local government support. |

## 1. Introduction

Decentralization transferred important planning, service-delivery, regulatory, and development responsibilities to subnational governments. The central rationale was that public decisions could respond more closely to local preferences and information when authority and resources were located near citizens. Fiscal federalism described this potential as an allocative advantage, while governance research emphasized that local responsiveness still depended on participation, accountability, state capacity, and the alignment of finance with assigned functions.<sup>12-16</sup>

In the Philippines, Republic Act No. 7160 established local autonomy and required local governments to promote general welfare, economic prosperity, employment, and coordinated development. It also organized local development councils for socioeconomic planning, investment programming, and citizen participation.<sup>1</sup> The Supreme Court decision commonly associated with the Mandanas-Garcia cases broadened the tax base used to calculate the local government share in national taxes.<sup>2</sup> Executive Order No. 138 then directed the full devolution of specified executive functions and the preparation of devolution transition plans.<sup>3</sup> These changes enlarged the practical importance of local administrative capacity: more resources and functions created an opportunity for locally responsive action, but they also increased the need for coherent planning, competent implementation, and public accountability.

Livelihood development illustrated this implementation challenge. Households rarely needed only a single input. A grant without enterprise capability could be consumed or invested poorly; training without working capital could remain unapplied; production support without market access could lead to low prices or unsold goods; and a referral without follow-up could fail when requirements, transport, or communication became difficult. Economic empowerment therefore involved more than income. It included the resources, agency, security, knowledge, networks, and voice through which people made and acted on livelihood choices.<sup>18-21</sup>

Apayao provided a consequential setting for studying these connections. The Philippine Statistics Authority listed the province as comprising seven municipalities and 133 barangays. Its population reached 126,587 in the 2024 census.<sup>4</sup> The provincial economy

was estimated at PHP 12.07 billion at constant 2018 prices in 2024 and grew by 0.3%, after a 4.6% increase in the preceding year. Services accounted for 50.6% of provincial output.<sup>5,6</sup> The combination of a dispersed settlement pattern, rural production, varied municipal access, and an increasingly service-oriented economy made both coordination and geographic equity central to local livelihood policy. Public livelihood assistance in the province operated within an intergovernmental and interagency environment. The Department of Social Welfare and Development Sustainable Livelihood Program combined capacity building, seed capital, skills training, employment facilitation, and organization development.<sup>7</sup> The Department of Labor and Employment Integrated Livelihood Program provided livelihood grants and capacity building linked to inclusive growth and local planning.<sup>9</sup> Department of Trade and Industry programs included Negosyo Centers, mentoring, shared service facilities, financing referrals, and livelihood support in barangays.<sup>10</sup> Technical Education and Skills Development Authority community-based training was designed for marginalized groups and often worked through local partnerships.<sup>11</sup> The provincial agro-industrial trade and tourism fair likewise demonstrated collaboration among the provincial government, municipal governments, and national line agencies.<sup>8</sup> The policy architecture was therefore extensive, but the relevant unit of performance was the participant pathway. A resident had to learn about a program, qualify through a fair process, reach the service, receive appropriate training or inputs, connect with markets and finance, and obtain problem-solving support after initial assistance. Fragmentation at any point could reduce the value of the other components. The study examined this pathway as a local system rather than as a collection of isolated projects.

### *1.1 Decentralization, local capacity, and economic development*

Decentralization was expected to improve development when local authorities used superior knowledge of needs, costs, institutions, and opportunities. Faguet's review showed that decentralization could reshape governance by changing information, participation, and accountability relationships, although results varied with political and institutional conditions.<sup>13</sup> Cross-country evidence associated some forms of decentralization with higher per capita income but did not show a uniform relationship with poverty or human development.<sup>14</sup> Provincial evidence also indicated that the quality of local governance conditioned the relationship between fiscal decentralization and growth.<sup>15</sup>

Authority alone was insufficient. Rodríguez-Pose and Vidal-Bover reported that gaps between devolved responsibilities and fiscal resources hindered regional growth.<sup>16</sup> Philippine local governments could also mobilize credit for capital investments, socioeconomic enterprises, and income-generating projects, subject to statutory safeguards, but borrowing capacity varied substantially.<sup>17</sup> These findings suggested that local economic development depended on both formal authority and the operational ability to assemble finance, staff, partnerships, evidence, and implementation routines.

Participatory institutions were another pathway. Local development councils were expected to link needs assessment with investment programming and sectoral representation.<sup>1</sup> Participation could improve information and legitimacy, but it did not automatically remove elite influence, transaction costs, or capacity constraints. Experimental evidence on decentralized public-goods allocation also showed that the rules used to allocate local resources affected participation and project choices.<sup>22</sup> For livelihood programs, meaningful participation therefore required transparent criteria, accessible grievance routes, and evidence that beneficiary feedback altered implementation.

### *1.2 Livelihood systems and economic empowerment*

The sustainable livelihoods approach organized well-being around assets, vulnerability, institutions, strategies, and outcomes.<sup>20</sup> It directed attention to human, social, financial, natural, and physical resources rather than treating a livelihood as income alone. Kabeer's resources-agency-achievements framework similarly distinguished the preconditions for choice, the exercise of choice, and realized outcomes.<sup>18</sup> The empowerment framework developed by Alsop, Bertelsen, and Holland further connected a person's agency with the opportunity structure in which choices were made.<sup>19</sup> Together, these perspectives justified measuring financial agency, livelihood security, enterprise capability, and participation or voice.

Evidence on enterprise development also supported complementary services. Business practices were strongly associated with productivity and survival among small firms, while a randomized study showed that different ways of obtaining marketing and finance expertise produced different business responses.<sup>23,24</sup> A mixed-methods systematic review of value-chain interventions found modest improvements in income, assets, productivity, and savings, with continuing constraints related to market position, social norms, resources, and decision-making power.<sup>21</sup> These findings cautioned against equating the distribution of inputs with empowerment.

An integrated livelihood system was therefore expected to join five functions. Accessibility and targeting connected eligible residents with support. Capability building developed usable technical and business skills. Market linkage connected production with demand, standards, aggregation, and price information. Finance and input linkage made investment feasible. Follow-up and accountability identified implementation problems, maintained referrals, and allowed participants to influence service quality. The study treated these functions as distinct but mutually reinforcing.

### *1.3 Research gap, objectives, and hypotheses*

Philippine policy documents described LGU mandates and national programs described available services, but a participant-centered analysis was needed to test whether multiple local support domains operated together in a geographically dispersed province. A single provincial average could also conceal the dependence of observations within barangays and municipalities. The study addressed both issues through multidomain measurement, multilevel analysis, administrative outcome checks, and qualitative explanation. The study determined: (1) the level and measurement quality of local livelihood support and economic empowerment; (2) changes in recorded net livelihood income, regular saving, and formal registration from entry to the 12-month review; (3) the adjusted associations of five support domains with economic empowerment after accounting for participant, barangay, and municipality conditions; (4) whether selected support domains interacted; and (5) how participants and implementers explained access, service integration, aftercare, and geographic constraints.

Five positive main-effect hypotheses were specified for accessibility and targeting, capability-building quality, market linkage, finance and input linkage, and follow-up and accountability. Three interaction hypotheses were specified before analysis: market linkage with finance and input linkage, capability building with follow-up, and accessibility with travel burden. The hypotheses concerned associations and complementarity. They did not establish that LGU support alone caused the observed outcomes.

## 2. Methods

### 2.1 Design

An explanatory sequential mixed-methods design was used. The quantitative phase described program support, tested measurement structure, examined participant outcomes over time, and estimated relationships while accounting for barangay clustering. The qualitative phase examined how and why the strongest, weakest, and unequal patterns occurred. Integration took place during interview sampling, interview-guide development, analysis, and construction of a joint display.<sup>37</sup> The design was observational. Entry and 12-month administrative records supplied repeated outcomes, but no untreated or delayed-treatment comparison group was available. Accordingly, longitudinal estimates described within-participant change and were not labeled program impacts. The multilevel empowerment analysis was cross-sectional and reported adjusted associations.

### 2.2 Setting and sampling frame

The study covered Calanasan, Conner, Flora, Kabugao, Luna, Pudtol, and Santa Marcela, which constituted all municipalities of Apayao.<sup>4</sup> The sampling frame combined verified municipal and partner-agency lists of adults who had entered a livelihood program and had reached a 12-month review. Duplicate names and transfers were reconciled before selection. Eligibility required residence in the municipality during program entry, age of at least 18 years, participation in a livelihood or employment-facilitation activity coordinated by an LGU or its formal partner, and the availability of an entry record and 12-month status record.

A multistage probability procedure was used. Municipality was the explicit stratum. Within strata, 49 barangays were selected with probability proportional to the number of eligible participants, while preserving coverage of all municipalities. Within each selected barangay, systematic sampling used a random start and the verified eligible list. Ten residents were targeted in each barangay. Of 490 invited participants, 462 completed the survey, for a 94.3% completion rate. The design was approximately self-weighting because barangay selection was proportional to size and a nearly constant number of persons was selected per chosen barangay. Normalized inverse-probability weights were retained for sensitivity analysis.

Table 1. Quantitative sample by municipality

| Municipality  | Selected barangays | Invited | Completed | Completion rate |
|---------------|--------------------|---------|-----------|-----------------|
| Calanasan     | 6                  | 60      | 55        | 91.7%           |
| Conner        | 8                  | 80      | 77        | 96.3%           |
| Flora         | 5                  | 50      | 47        | 94.0%           |
| Kabugao       | 7                  | 70      | 67        | 95.7%           |
| Luna          | 9                  | 90      | 86        | 95.6%           |
| Pudtol        | 7                  | 70      | 65        | 92.9%           |
| Santa Marcela | 7                  | 70      | 65        | 92.9%           |
| Total         | 49                 | 490     | 462       | 94.3%           |

Note. Barangay counts referred to selected primary sampling units, not all barangays in each municipality. The province had 133 barangays in the official geographic classification.

### 2.3 Power and sample-size justification

A Monte Carlo power analysis used 2,000 replications, 49 barangays, a mean cluster size of 9.4, a null intraclass correlation of .10, a two-sided alpha of .05, and a standardized focal coefficient of .15. The planned analytic size of 450 yielded estimated power of .82 for a main support-domain coefficient after including the prespecified covariates. The target of 490 invitations allowed for nonresponse. Interaction tests were treated as secondary because power for cross-level or product terms was lower and depended on the joint distribution of the component scales.

### 2.4 Quantitative measures

The Local Government Livelihood Support Index contained 25 statements, with five items in each domain: accessibility and targeting, capability-building quality, market linkage, finance and input linkage, and follow-up and accountability. Respondents rated observable experiences during the 12 months after program entry on a five-point scale from 1 (strongly disagree) to 5 (strongly agree). Items asked whether criteria were understandable, venues or outreach were reachable, training was applicable, buyer or market information was usable, financial or production referrals were completed, and implementers returned to resolve problems.

The Economic Empowerment Index contained 20 statements in four five-item domains: financial agency, livelihood security and resilience, market and enterprise capability, and participation and voice. The same five-point response scale was used. Financial agency addressed control and planning over livelihood resources. Security and resilience addressed continuity, buffers, and the ability to respond to shocks. Market and enterprise capability addressed costing, records, customers, standards, and decisions. Participation and voice addressed access to information, feedback, group action, and influence over livelihood services.<sup>18–20</sup>

Administrative outcomes were abstracted from entry and 12-month review forms. Monthly net livelihood income was defined as cash revenue minus documented recurring operating costs during a typical month. Seasonal activities used a 12-month net total divided by 12. Regular saving indicated a planned deposit or retained business reserve in at least three of the preceding four weeks. Formal registration indicated an active registration or permit appropriate to the activity. Enterprise continuity indicated that the

livelihood remained active at the 12-month review. Record abstraction used a written codebook, dual review of 15% of records, and reconciliation against source forms.

### 2.5 Content validity, pilot work, and construct validity

Eight reviewers with experience in local development, livelihood implementation, public administration, enterprise development, Indigenous community engagement, and measurement evaluated relevance and clarity. Item-level content-validity indices ranged from .88 to 1.00 and the average scale-level index was .96. Aiken V ranged from .84 to .98. These indices exceeded customary decision thresholds while leaving a clear audit trail of revised wording.<sup>25,26</sup>

The questionnaire was piloted with 58 eligible livelihood participants in nonselected barangays. Cognitive debriefing led to shorter sentences, concrete time references, and examples that distinguished a referral from a completed service. The pilot was used for comprehension and preliminary reliability; it was not combined with the final analytic records.

Ordinal confirmatory factor analyses used the main survey responses, polychoric correlations, and weighted least squares with mean- and variance-adjusted statistics. Ordered categories were preserved. The prespecified five-factor support structure yielded CFI = .957, TLI = .951, RMSEA = .041 (90% CI [.036, .046]), and SRMR = .048. The four-factor empowerment structure yielded CFI = .964, TLI = .958, RMSEA = .038 (90% CI [.032, .044]), and SRMR = .044. Standardized item loadings ranged from .59 to .86. These results supported the planned scoring; no residual correlations were added after examining modification indices.<sup>28,29</sup>

McDonald omega was reported because its interpretation did not require equal factor loadings.<sup>27</sup> Domain omega values ranged from .87 to .92, and total-index values were .94 for livelihood support and .93 for economic empowerment. Reliability was treated as evidence about score consistency in this sample, not as proof of validity.

Table 2. Scale composition and measurement evidence

| Construct                          | Items | M    | SD   | Omega | Loading range |
|------------------------------------|-------|------|------|-------|---------------|
| LGU livelihood support, total      | 25    | 3.79 | 0.58 | .94   | .59-.85       |
| Accessibility and targeting        | 5     | 3.91 | 0.63 | .88   | .61-.80       |
| Capability-building quality        | 5     | 3.88 | 0.61 | .91   | .67-.85       |
| Market linkage                     | 5     | 3.51 | 0.72 | .90   | .64-.83       |
| Finance and input linkage          | 5     | 3.70 | 0.69 | .89   | .62-.82       |
| Follow-up and accountability       | 5     | 3.83 | 0.65 | .92   | .70-.86       |
| Economic empowerment, total        | 20    | 3.82 | 0.55 | .93   | .60-.84       |
| Financial agency                   | 5     | 3.78 | 0.63 | .89   | .64-.81       |
| Livelihood security and resilience | 5     | 3.69 | 0.66 | .87   | .60-.79       |
| Market and enterprise capability   | 5     | 3.86 | 0.60 | .90   | .66-.84       |
| Participation and voice            | 5     | 3.94 | 0.58 | .88   | .63-.80       |

### 2.6 Data-collection procedures and safeguards

Municipal coordinators provided updated lists and source records only after duplicate and eligibility checks. Trained field personnel who were not responsible for approving livelihood assistance administered the questionnaire in a private setting. Local-language clarification was permitted through a standardized glossary, but responses were not suggested. Survey forms, contact lists, and administrative outcomes were stored separately. A randomly generated identifier linked the survey and outcome records.

The protocol described voluntariness, the right to skip questions, separation of participation from program eligibility, and the reporting of grouped findings. Records exported for analysis contained no names, exact addresses, telephone numbers, or free-text identifiers. Municipal reports suppressed small cells and did not rank individual staff members. Indigenous affiliation was self-identified, used only for equity analysis, and interpreted without essentializing culturally diverse communities.

### 2.7 Quantitative analysis

Range, duplicate, skip-pattern, and internal-consistency checks preceded analysis. Scale scores were computed when at least four of five domain items were present; the respondent's mean for completed items replaced the remaining single item. This rule affected 23 domain scores and 0.10% of all scale responses. Covariate missingness ranged from 0% to 1.5% and was addressed through 25 chained-equation imputations. Imputation included the outcome, all predictors, municipality, barangay, repeated administrative outcomes, and auxiliary indicators. Estimates were combined through Rubin's rules.<sup>30</sup>

Means and standard deviations summarized scale scores. Medians and interquartile ranges summarized raw income because the distribution was right-skewed. A three-level linear mixed-effects analysis of log income included occasions within participants within barangays, with random intercepts for participants and barangays. The exponentiated time coefficient was reported as a geometric mean ratio. Regular saving and formal registration were examined through population-averaged logistic generalized estimating equations with a repeated time indicator, exchangeable correlation, barangay clustering, and robust small-sample-corrected standard errors. These analyses estimated within-participant change without attributing the change solely to the program. The primary empowerment analysis used a random-intercept linear mixed-effects regression with participants nested in 49 barangays. Municipality entered as a fixed effect. The five support-domain scores were standardized and entered simultaneously. Prespecified covariates included sex, age, education, Indigenous affiliation, baseline log income, livelihood sector, program duration, and travel burden exceeding 60 minutes. Restricted maximum likelihood estimated the specification, and Kenward-Roger small-sample denominator degrees of freedom were used. Two thousand barangay-cluster bootstrap replications checked confidence-interval stability, and normalized sampling weights provided a design sensitivity analysis.<sup>31,32</sup>

Three planned interactions were added separately to the main-effects specification. Holm correction controlled familywise error.<sup>33</sup> Conditional predictions were calculated at one standard deviation below and above the interacting support domains. Variance-inflation factors, residual plots, influence measures, linearity checks, and alternative complete-case estimates were examined. Marginal R-squared described variance explained by fixed effects, and conditional R-squared included the barangay random intercept.<sup>34</sup> Two-sided p values were interpreted with 95% confidence intervals and substantive magnitude. Statistical significance alone was not treated as policy importance.

### 2.8 Qualitative sampling and analysis

Thirty-two interviews were completed after preliminary quantitative analysis. The municipal sample included one livelihood focal person, one planning, enterprise-development, or employment officer, one barangay implementer, and one livelihood participant from each of the seven municipalities (n = 28). Four additional participants came from provincial or national partner-agency field offices. Selection varied the interviews by municipality, travel burden, livelihood sector, support score, and empowerment score. The final interviews provided sufficient information power because the aim was focused, the sample was specific, interviews were detailed, and cross-case patterns recurred.<sup>36</sup> Interviews lasted 42 to 73 minutes. Questions addressed outreach, targeting, training application, access to finance or inputs, buyers and market information, monitoring, complaints, coordination, and barriers created by distance or connectivity. The Framework Method was used to code and chart cases by role and municipality.<sup>35</sup> Two analysts independently coded eight transcripts. Cohen kappa was .86 across the final codebook; disagreements were resolved through transcript review.<sup>38</sup> To avoid overstating precision, results reported analytic summaries rather than reconstructed quotations.

## 3. Results

### 3.1 Participant profile and data completeness

The 462 participants came from 49 barangays in all seven municipalities. Women comprised 58.9% of the sample, the median age was 42 years (interquartile range, 34-51), and 71.2% identified as belonging to an Indigenous cultural community. Agriculture, forestry, or livestock activities accounted for 53.5% of livelihoods; food processing and manufacturing, 17.3%; retail and other services, 21.4%; and wage or employment facilitation, 7.8%. Median program exposure was 19 months (interquartile range, 15-26). Thirty-one percent reported a usual one-way travel time of more than 60 minutes to the primary municipal service point. Survey item nonresponse was low, and all participants had a valid total empowerment score. No selected barangay contributed fewer than eight completed surveys. The primary null analysis yielded a barangay intraclass correlation of .12 for economic empowerment, indicating that 12% of outcome variance occurred between barangays. This dependence supported use of a multilevel analysis.

Table 3. Participant and livelihood profile (n = 462)

| Characteristic                            | n   | % or summary         |
|-------------------------------------------|-----|----------------------|
| Women                                     | 272 | 58.9%                |
| Men                                       | 190 | 41.1%                |
| Indigenous cultural community affiliation | 329 | 71.2%                |
| Agriculture, forestry, or livestock       | 247 | 53.5%                |
| Food processing or manufacturing          | 80  | 17.3%                |
| Retail and other services                 | 99  | 21.4%                |
| Wage or employment facilitation           | 36  | 7.8%                 |
| Travel burden greater than 60 minutes     | 143 | 31.0%                |
| Age, years                                | -   | Median 42; IQR 34-51 |
| Program exposure, months                  | -   | Median 19; IQR 15-26 |

Note. Percentages could differ by 0.1 point because of rounding. Affiliation was self-identified. IQR = interquartile range.

### 3.2 Levels of livelihood support and empowerment

The overall livelihood support score was 3.79 (SD = 0.58). Accessibility and targeting received the highest support-domain mean (M = 3.91, SD = 0.63), followed by capability-building quality (M = 3.88, SD = 0.61), follow-up and accountability (M = 3.83, SD = 0.65), and finance and input linkage (M = 3.70, SD = 0.69). Market linkage was lowest (M = 3.51, SD = 0.72). Item distributions showed that buyer continuity, transport arrangements, and timely price information accounted for much of the weaker market rating. Overall economic empowerment averaged 3.82 (SD = 0.55). Participation and voice was strongest (M = 3.94, SD = 0.58), followed by market and enterprise capability (M = 3.86, SD = 0.60), financial agency (M = 3.78, SD = 0.63), and livelihood security and resilience (M = 3.69, SD = 0.66). The pattern indicated that participants reported greater information, group participation, and enterprise confidence than protection against shocks or irregular cash flow.

### 3.3 Administrative outcomes from entry to the 12-month review

Median monthly net livelihood income increased from PHP 5,400 (interquartile range, PHP 3,800-PHP 7,900) at entry to PHP 7,400 (interquartile range, PHP 5,100-PHP 10,700) at the 12-month review. In the three-level log-income analysis, the geometric mean was 31% higher at review than at entry (geometric mean ratio = 1.31, 95% CI [1.25, 1.38], p < .001). A log-scale residual check showed no severe departure from the distributional requirements, and exclusion of the highest 1% of income values yielded a ratio of 1.30. Regular saving increased from 36.4% to 58.2%. The population-averaged odds of regular saving at the review were 2.47 times the entry odds (95% CI [1.95, 3.14], p < .001). Formal registration increased from 41.3% to 57.8% (OR = 1.94, 95% CI [1.55, 2.43], p < .001). At 12 months, 86.6% of livelihoods remained active and 18.4% reported that the activity regularly engaged at least one additional paid worker. The continuity and worker indicators had no comparable entry measure and were reported only as review status.

Table 4. Administrative livelihood outcomes

| Outcome                          | Entry                   | 12-month review          | Estimate    | 95% CI    | p      |
|----------------------------------|-------------------------|--------------------------|-------------|-----------|--------|
| Monthly net income, median (IQR) | PHP 5,400 (3,800-7,900) | PHP 7,400 (5,100-10,700) | GMR 1.31    | 1.25-1.38 | < .001 |
| Regular saving                   | 168 (36.4%)             | 269 (58.2%)              | OR 2.47     | 1.95-3.14 | < .001 |
| Formal registration              | 191 (41.3%)             | 267 (57.8%)              | OR 1.94     | 1.55-2.43 | < .001 |
| Livelihood remained active       | Not comparable          | 400 (86.6%)              | Status only | -         | -      |
| Additional paid worker           | Not comparable          | 85 (18.4%)               | Status only | -         | -      |

Note. GMR = geometric mean ratio from a three-level log-income analysis. OR = population-averaged odds ratio from repeated-measure generalized estimating equations. The estimates described change among participants and did not provide a comparison-group contrast.

### 3.4 Multilevel associations with economic empowerment

All five support domains retained positive adjusted associations when entered together. Follow-up and accountability had the largest standardized coefficient ( $b = 0.24$ , 95% CI [0.17, 0.31]), followed by market linkage ( $b = 0.21$ , 95% CI [0.13, 0.29]) and capability-building quality ( $b = 0.18$ , 95% CI [0.10, 0.26]). Accessibility and targeting ( $b = 0.11$ , 95% CI [0.04, 0.18]) and finance and input linkage ( $b = 0.09$ , 95% CI [0.02, 0.16]) were smaller but remained distinguishable from zero.

Travel burden exceeding 60 minutes was negatively associated with empowerment ( $b = -0.12$ , 95% CI [-0.19, -0.05]). Women reported a small positive adjusted difference ( $b = 0.06$ , 95% CI [0.01, 0.11]), and baseline log income had a small positive association ( $b = 0.07$ , 95% CI [0.01, 0.13]). Age, education, Indigenous affiliation, program duration, and livelihood sector did not have confidence intervals that excluded zero after the support domains and other covariates were included. The municipality fixed-effect test was not statistically significant,  $F(6, 42.3) = 2.16$ ,  $p = .066$ , and no municipality ranking was inferred.

The fixed effects explained 52% of empowerment variance (marginal R-squared = .52), and the full specification explained 60% when the barangay random intercept was included (conditional R-squared = .60). Variance-inflation factors ranged from 1.34 to 2.08. Residual and influence checks did not identify a single barangay that determined the focal conclusions. Weighted, complete-case, and cluster-bootstrap analyses produced estimates within 0.02 standardized units of the primary coefficients.

Table 5. Random-intercept analysis of economic empowerment (n = 462; 49 barangays)

| Predictor                    | Std. b | SE    | 95% CI         | p      |
|------------------------------|--------|-------|----------------|--------|
| Accessibility and targeting  | 0.11   | 0.036 | 0.04 to 0.18   | .003   |
| Capability-building quality  | 0.18   | 0.041 | 0.10 to 0.26   | < .001 |
| Market linkage               | 0.21   | 0.041 | 0.13 to 0.29   | < .001 |
| Finance and input linkage    | 0.09   | 0.036 | 0.02 to 0.16   | .014   |
| Follow-up and accountability | 0.24   | 0.035 | 0.17 to 0.31   | < .001 |
| Travel burden > 60 minutes   | -0.12  | 0.036 | -0.19 to -0.05 | .001   |
| Woman                        | 0.06   | 0.025 | 0.01 to 0.11   | .019   |
| Baseline log income          | 0.07   | 0.031 | 0.01 to 0.13   | .026   |
| Age                          | -0.01  | 0.025 | -0.06 to 0.04  | .683   |
| Education                    | 0.04   | 0.026 | -0.01 to 0.09  | .119   |
| Indigenous affiliation       | 0.02   | 0.031 | -0.04 to 0.08  | .510   |
| Program duration             | 0.03   | 0.026 | -0.02 to 0.08  | .247   |

Note. Continuous variables were standardized. Municipality and livelihood-sector fixed effects were included but not shown. Estimates were combined across 25 imputations. Confidence intervals agreed with 2,000 barangay-cluster bootstrap intervals to the displayed precision.

### 3.5 Planned interactions

Market linkage interacted positively with finance and input linkage ( $b = 0.10$ , raw  $p = .002$ , Holm-adjusted  $p = .006$ ). Capability-building quality also interacted with follow-up and accountability ( $b = 0.08$ , raw  $p = .009$ , Holm-adjusted  $p = .018$ ). The accessibility-by-travel-burden interaction was not retained after adjustment ( $b = 0.05$ , raw  $p = .071$ , Holm-adjusted  $p = .071$ ).

The market-by-finance interaction was substantively meaningful. At low market and low finance support, the predicted empowerment score was 3.43. High market support with low finance support produced 3.81; low market support with high finance support produced 3.65; and high support on both domains produced 4.32. The high-high condition therefore exceeded the sum expected from treating each component as a stand-alone service. The capability-by-follow-up pattern was similar but smaller: training quality had a stronger relationship with empowerment when participants also received timely coaching, troubleshooting, and status updates.

Table 6. Prespecified interaction tests

| Interaction                            | Std. b | 95% CI        | Raw p | Holm p | Decision     |
|----------------------------------------|--------|---------------|-------|--------|--------------|
| Market linkage x finance/input linkage | 0.10   | 0.04 to 0.16  | .002  | .006   | Retained     |
| Capability building x follow-up        | 0.08   | 0.02 to 0.14  | .009  | .018   | Retained     |
| Accessibility x travel burden          | 0.05   | -0.01 to 0.11 | .071  | .071   | Not retained |

Note. Each interaction was added separately to the adjusted main-effects specification. Holm  $p$  controlled the familywise error rate across the three planned tests.

### 3.6 Qualitative findings

#### 3.6.1 Barangay outreach and transparent targeting lowered entry barriers

Participants and implementers described barangay-level orientation, posted criteria, group validation, and local assistance with documentary requirements as the practices that made programs reachable. Outreach was most useful when schedules reflected farm work, transport availability, and seasonal obligations. Where information passed mainly through personal networks, residents questioned fairness even when the formal eligibility rule had been followed.

The theme explained the high accessibility and targeting mean while also clarifying why travel burden remained negative after adjustment. An invitation did not eliminate the cost of reaching municipal offices, returning with additional documents, or maintaining communication when signal coverage was weak. Participants distinguished formal availability from usable access.

#### 3.6.2 Training created value when coaching supported application

Training was described as useful when it addressed the participant's actual product, costs, production cycle, or customer base. Practical exercises, enterprise records, and follow-up visits helped participants apply the content. General seminars with no product-specific practice were remembered positively but produced fewer reported changes in pricing, inventory, quality control, or cash management.

Implementers likewise described aftercare as a way to identify incorrect costing, equipment problems, missing permits, group conflict, and unrealistic production plans before these issues became terminal. This convergence explained both the strong follow-up coefficient and its interaction with capability building.

#### 3.6.3 Markets and finance functioned as complementary levers

Participants reported that finance was most productive when they knew what to produce, for whom, at what quality, and at what likely margin. Buyer introductions, market fairs, institutional market referrals, aggregation, packaging advice, and price information reduced uncertainty. Conversely, a buyer opportunity could not be used when working capital, raw materials, storage, transport, or equipment were unavailable.

Several implementers described referrals across local government, DSWD, DTI, DOLE, TESDA, agriculture offices, cooperatives, and private buyers. The referral worked when one focal person tracked its status and helped the participant complete the next step. A simple list of agencies shifted the coordination burden back to the participant. This theme clarified why the high-market and high-finance combination had the strongest predicted empowerment.

#### 3.6.4 Monitoring and administrative continuity sustained support

Participants associated credible support with return visits, clear contact persons, timely explanations, and visible action on a problem. Implementers reported that monitoring records made it possible to identify inactive assets, supply shortages, buyer losses, group leadership problems, and assistance that had not reached the intended user. Monitoring was viewed less favorably when it consisted only of photographs or forms required near a reporting deadline.

Administrative continuity also mattered when personnel changed. Shared participant records, referral logs, service calendars, and written turnover notes allowed a case to continue. Where information remained with one staff member, transfer or reassignment caused participants to repeat requirements and weakened trust. This theme provided an organizational explanation for the leading follow-up and accountability coefficient.

#### 3.6.5 Geography and connectivity raised transaction costs

Across roles, distance affected more than initial attendance. It raised the cost of purchasing inputs, moving small volumes, meeting buyers, repairing equipment, complying with documentation, and making follow-up visits. Weather and road conditions made these costs variable. Weak mobile or internet connectivity also delayed market information and status updates.

Participants proposed clustering orders, mobile service days, municipal pickup points, shared transport, and combined monitoring visits. Implementers emphasized that identical program packages could be unequal when one participant absorbed much higher travel and communication costs. The theme therefore supported an equity-oriented interpretation of the negative travel-burden coefficient.

#### 3.6.6 Participation and culturally responsive delivery strengthened agency

Participants valued opportunities to select an activity, question requirements, adjust schedules, and raise implementation concerns through a group or barangay contact. Implementers described community validation and consultation with local leaders as useful when these processes informed eligibility and delivery without substituting patronage for transparent criteria. Local language, respectful pacing, and recognition of customary obligations improved understanding.

The theme was consistent with the high participation and voice score. It also cautioned that attendance at a meeting was not equivalent to influence. Participants viewed consultation as meaningful when feedback changed timing, location, product choice, group arrangements, or the form of follow-up.

### 3.7 Mixed-methods integration

Table 7. Joint display of quantitative findings and qualitative explanations

| Quantitative finding                                                                      | Qualitative explanation                                                                                                           | Integrated interpretation                                                                                                     |
|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Accessibility/targeting was favorable, yet long travel had negative adjusted coefficient. | Barangay outreach and clear criteria reduced entry barriers; repeated travel, weak signal, and documentation still imposed costs. | Proximity at enrollment was insufficient; usable access required decentralized follow-through and transaction-cost reduction. |

| Quantitative finding                                              | Qualitative explanation                                                                                                      | Integrated interpretation                                                                                 |
|-------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Follow-up/accountability had the largest main association.        | Return visits, one accountable contact, referral tracking, and record continuity resolved implementation failures.           | Aftercare was a core livelihood service rather than an administrative add-on.                             |
| Market linkage was weakest but had a strong adjusted association. | Buyer continuity, price information, aggregation, transport, and standards remained difficult.                               | Market-system functions offered high leverage precisely because participants encountered persistent gaps. |
| Market and finance support interacted.                            | Capital was useful when demand and margins were known; market opportunities required working capital, inputs, and logistics. | Integrated sequencing generated more value than disconnected referrals.                                   |
| Capability building interacted with follow-up.                    | Practice, coaching, and troubleshooting converted seminar content into enterprise routines.                                  | Training quality depended partly on post-training application support.                                    |
| Participation/voice was the strongest empowerment domain.         | Choice, respectful communication, group action, and visible response to feedback strengthened agency.                        | Participation had value when it changed service decisions, not merely when it documented attendance.      |

#### 4. Discussion

##### 4.1 Principal findings

The study found that local livelihood support in Apayao was multidimensional and generally favorable, but its domains did not contribute equally. Follow-up and accountability, market linkage, and capability building had the strongest adjusted relationships with economic empowerment. Finance and access remained important, yet their value depended partly on the service environment around them. Administrative records also showed improvements in income, regular saving, and formal registration during the first 12 months, although the absence of a comparison group prevented a causal attribution.

The results supported a progression from devolution to implementation and from implementation to participant capability. Local autonomy created room for tailoring and coordination, but empowerment was associated with what residents actually experienced: reachable services, applicable skills, usable capital, credible market connections, and responsive aftercare. This distinction was consistent with research showing that decentralization outcomes depended on governance quality, participation, and the match between functions and resources.<sup>13–16</sup>

##### 4.2 From fiscal and administrative devolution to local capability

The legal framework gave LGUs a broad general-welfare and development role, while the expanded national tax allotment and full-devolution policy increased the scale of local responsibility.<sup>1–3</sup> The findings indicated that implementation capability was the decisive bridge. A livelihood focal person, planning office, social welfare office, agriculture office, employment office, barangay, or partner agency could each perform well, yet the participant could still encounter a broken pathway if information and responsibility did not move across offices.

This result gave practical meaning to the warning about unfunded or weakly supported mandates.<sup>16</sup> Resources included more than a budget line. They included staff time, travel, information systems, procurement schedules, technical competence, buyer relationships, monitoring capability, and authority to resolve a stalled referral. The implication was that devolution transition planning should have mapped participant journeys and service capacities, not only transferred functions and expenditure categories.

##### 4.3 Bundled support and the market-finance complement

The positive market-by-finance interaction was the most policy-relevant statistical pattern. Capital alone could enlarge production without securing a customer. A buyer connection alone could create an order that the participant lacked the cash, input supply, equipment, or logistics to fulfill. When both conditions were strong, participants reported substantially higher empowerment. This result agreed with value-chain evidence that enterprise outcomes were shaped by skills, inputs, coordination, and market position rather than by a single intervention.<sup>21</sup>

The finding did not imply that every LGU should directly lend money or guarantee buyers. A more defensible role was stewardship of a local support network: diagnosing bottlenecks, sequencing services, maintaining verified referral partners, aggregating demand or supply where appropriate, and tracking whether a referral was completed. Existing DSWD, DOLE, DTI, TESDA, agriculture, cooperative, and private-sector services could then be organized around a common participant plan.<sup>7,9–11</sup>

##### 4.4 Follow-up as an implementation and accountability function

Follow-up and accountability had the largest main association and strengthened the relationship of capability building with empowerment. The qualitative findings showed why. Enterprise development contained predictable adjustment problems: prices were incorrect, inputs arrived late, equipment failed, group rules were unclear, a buyer changed requirements, or permits remained incomplete. A return contact allowed participants and implementers to correct these problems.

Monitoring therefore needed to move from compliance evidence to learning evidence. Photographs, attendance sheets, and liquidation documents remained necessary for public accountability, but they did not reveal whether an activity had customers, margins, usable assets, savings, or a solvable obstacle. A minimum aftercare protocol could have combined participant status, cash-flow or production indicators, referral status, emerging risk, agreed action, responsible office, and follow-up date.

##### 4.5 Access, geography, and equity

The negative travel-burden coefficient showed that a geographically uniform offer could produce unequal access. Distance affected

attendance, but it also affected every subsequent transaction: buying inputs, delivering products, repairing tools, submitting requirements, and contacting implementers. This result required a service-design response rather than a conclusion that remote participants lacked motivation. Barangay outreach, mobile service days, grouped compliance schedules, consolidated transport, shared delivery points, offline-ready communication, and clustered monitoring were plausible responses. An equity dashboard could have compared reach, completion, referral time, market access, enterprise continuity, and participant outcomes by travel burden, sex, sector, and cultural community. The absence of an adjusted Indigenous-affiliation difference in the present analysis did not prove equality; it indicated that the index did not detect a mean gap after measured conditions were included.

#### 4.6 Administrative and policy implications

First, the provincial and municipal LGUs needed a shared livelihood-results architecture. A small set of common definitions could have followed each participant from outreach through the 12-month review while allowing programs to retain their statutory forms. Second, interagency agreements needed service standards for referral acceptance, required documents, status updates, and escalation. Third, local development and investment planning needed to use participant and market evidence rather than counts of trainings, grants, or attendees alone. Fourth, budgeting needed to protect aftercare, market facilitation, transport-aware delivery, and data quality. These functions could be crowded out because they were less visible than equipment distribution or launch events. Fifth, beneficiary organizations needed support for governance, records, aggregation, and negotiation. Collective organization could reduce transaction costs and strengthen voice, but poorly governed groups could also reproduce exclusion. Transparent membership, role, and grievance rules remained necessary. Finally, evaluation needed a stronger counterfactual. A future phased rollout could use randomized order, a matched comparison, or an interrupted time series with repeated preintervention observations. Income measurement needed consistent definitions and seasonal windows. Administrative records could then support causal evaluation without displacing qualitative inquiry into dignity, agency, and context.

#### 5. Conclusion

Livelihood development in Apayao was strongest when local government support operated as a connected system. Accessibility and fair targeting opened the pathway; capability building strengthened skills; finance and inputs made action feasible; market linkage connected effort with demand; and follow-up turned initial assistance into an adaptive relationship. Follow-up, market linkage, and capability building showed the strongest independent associations with economic empowerment, while the market-finance interaction demonstrated the value of coordinated support.

Devolution supplied LGUs with an expanded platform for local action, but economic empowerment depended on the quality of implementation experienced by residents. The most defensible policy response was therefore not an isolated expansion of grants or seminars. It was a transparent, travel-aware, evidence-using system that joined barangays, municipalities, the province, national agencies, participant organizations, and markets around a trackable livelihood pathway.

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