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Sustainable Livelihoods in Agribusiness: An Empirical Analysis of Life Satisfaction Determinants in Geographically Isolated and Disadvantaged Areas (Gidas) of Region XI, Philippines

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Abstract
Despite significant government investments in rural development, GIDAs continue to face persistent challenges in achieving sustainable livelihoods, necessitating empirical evidence to guide policy interventions. This study investigates the complex relationships between livelihood capital dimensions, livelihood education, social adaptation mechanisms, and life satisfaction among agribusiness stakeholders in Geographically Isolated and Disadvantaged Areas (GIDAs) of Region XI, Philippines. A cross-sectional survey design employed stratified multi-stage sampling to select 400 respondents from agribusiness sectors in Region XI. The study utilized validated psychometric instruments and data were analyzed using descriptive statistics, Pearson correlation analysis, and structural equation modeling (SEM) with SPSS 28.0 and AMOS 28.0. Contrary to conventional sustainable livelihoods theory, the structural equation model revealed paradoxical negative relationships between capital assets and life satisfaction. Only three livelihood capital components significantly predicted life satisfaction: natural capital (β = -0.071, p = 0.010), financial capital (β = -2.992×10^{-6}, p < 0.001), and social capital (β = -0.004, p = 0.006). The final model explained 3.7% of variance in life satisfaction (adjusted R^2 = 0.037, F = 6.165, p < 0.001), suggesting that traditional capital accumulation strategies may not enhance subjective well-being in GIDA contexts. Livelihood education scored consistently high across all dimensions (M = 4.704), while social adaptation showed strongest performance in life adaptation (M = 4.737) compared to productive adaptation (M = 4.070). The counterintuitive findings challenge conventional development approaches in GIDAs, suggesting that interventions should move beyond simple capital accumulation toward holistic strategies that consider cultural preservation, environmental stewardship, and community social harmony. Policymakers should prioritize quality over quantity in social network development and ensure that land tenure and income generation programs align with community-defined well-being objectives.
Keywords: *Sustainable livelihoods, structural equation modeling; life satisfaction; livelihood capital; social adaptation, livelihood education*

1.INTRODUCTION

1.1 Background and Context

Geographically Isolated and Disadvantaged Areas (GIDAs) represent one of the most pressing development challenges in the Philippines, affecting approximately 12 million people across 1,634 municipalities (Department of Health, 2019). These areas are characterized by their physical remoteness, limited infrastructure, and reduced access to essential services, creating unique barriers to economic development and social well-being (Balisacan et al., 2020). Region XI (Davao Region), despite being one of the Philippines' most economically dynamic regions, contains significant GIDA populations whose livelihoods depend heavily on agribusiness activities.

The sustainable livelihoods framework, developed by Chambers and Conway (1992) and later refined by the Department for International Development (DFID, 1999), provides a comprehensive lens for understanding how different forms of capital interact to influence household welfare and life satisfaction. In the context of GIDAs, this framework becomes particularly relevant as communities must leverage limited resources to achieve sustainable development outcomes.

1.2 Problem Statement

While existing literature acknowledges the challenges faced by GIDAs (Studies by Balisacan et al., 2020; Briones, 2021), there remains a significant gap in empirical research that systematically examines the relationships between livelihood capital dimensions, educational factors, social adaptation mechanisms, and subjective well-being outcomes in these marginalized areas. Specifically, no comprehensive structural

equation model has been developed to understand how these factors interact to influence life satisfaction among agribusiness stakeholders in Philippine GIDAs.

1.3 Research Objectives

This study aims to develop and test a comprehensive structural equation model of life satisfaction determinants in GIDAs. The specific objectives are:

1. To assess the levels of livelihood capital (natural, physical, human, social, and financial) among agribusiness stakeholders in GIDAs
2. To evaluate livelihood education levels across five dimensions: goal orientation, metacognitive knowledge, metacognitive experience, metacognitive choice, and monitoring
3. To examine social adaptation levels in terms of productive, life, and cultural adaptation
4. To measure life satisfaction levels regarding life needs and living environment
5. To determine the structural relationships between livelihood capital, livelihood education, social adaptation, and life satisfaction
6. To develop a parsimonious model predicting life satisfaction in GIDA agribusiness contexts

1.4 Theoretical Framework

This study is grounded in the sustainable livelihoods framework (Chambers & Conway, 1992; DFID, 1999), which posits that household welfare depends on the availability and accessibility of five capital assets: natural, physical, human, social, and financial capital. The framework is enhanced by incorporating Bandura's (2001) social cognitive theory to understand how educational factors and social adaptation mechanisms mediate the relationship between capital assets and life satisfaction outcomes.

2. LITERATURE REVIEW

2.1 Sustainable Livelihoods in Rural Contexts

The sustainable livelihoods approach has been extensively applied in rural development contexts, particularly in understanding how households in marginal areas manage risk and pursue livelihood strategies (Ellis, 2000; Scoones, 2009). Bebbington (1999) emphasized that capitals are not merely resources but are embedded in social, cultural, and institutional contexts that shape their accessibility and utility.

In the Philippine context, studies have shown that livelihood capital configurations vary significantly across different geographical and social contexts (Estudillo & Otsuka, 2016; Manlosa et al., 2019). However, few studies have examined these dynamics specifically in GIDAs, where geographical isolation compounds traditional rural development challenges.

2.2 Life Satisfaction in Agricultural Communities

Life satisfaction, defined as a global assessment of a person's quality of life according to their own chosen criteria (Shin & Johnson, 1978), has gained attention as an important development outcome beyond traditional economic indicators. In agricultural contexts, life satisfaction has been linked to various factors including income stability, social networks, and environmental quality (Ferrer-i-Carbonell & Gowdy, 2007; Kingdon & Knight, 2006).

Recent studies in Southeast Asia have shown that life satisfaction in rural areas is influenced by both material and non-material factors, with social capital often playing a more significant role than financial capital in determining well-being outcomes (Helliwell & Putnam, 2004; Pham & Reilly, 2009).

2.3 Agribusiness Development in Marginalized Areas

Agribusiness development in marginalized areas faces unique challenges including limited market access, inadequate infrastructure, and vulnerability to climate change (World Bank, 2018). However, successful agribusiness initiatives in these areas can serve as catalysts for broader economic development and improved quality of life (Christiaensen et al., 2011).

In the Philippines, agribusiness has been identified as a key sector for inclusive growth, particularly in areas like Region XI where agricultural productivity remains below potential (Philippine Statistics Authority, 2020). Understanding the factors that contribute to life satisfaction in these contexts is crucial for designing effective development interventions.

3. METHODOLOGY

3.1 Research Design

This study employed a cross-sectional survey design using a quantitative approach to examine the relationships between livelihood capital, livelihood education, social adaptation, and life satisfaction among agribusiness stakeholders in GIDAs of Region XI, Philippines.

3.2 Study Area and Population

The study was conducted in Region XI (Davao Region), Philippines, which comprises five provinces: Davao del Norte, Davao del Sur, Davao Oriental, Davao Occidental, and Davao de Oro. The region contains 43 municipalities classified as GIDAs by the Department of Health (DOH, 2019). The target population consisted of agribusiness stakeholders including farmers, agricultural workers, and small-scale entrepreneurs engaged in agricultural value chains within these GIDAs.

3.3 Sample Size and Sampling Technique

Using Yamane's (1967) formula with a 95% confidence level and 5% margin of error, a sample size of 400 respondents was determined. A multi-stage sampling technique was employed:

1. Stage 1: Stratified sampling to select 20 municipalities from the 43 GIDA municipalities in Region XI, proportional to population size
2. Stage 2: Random sampling to select 2-3 barangays per municipality
3. Stage 3: Systematic sampling to select 400 respondents from the selected barangays

3.4 Data Collection Instruments

The study utilized a structured questionnaire comprising five main sections:

3.4.1 Livelihood Capital Assessment

- Natural Capital: Measured through land ownership, access to water resources, and biodiversity indicators (7 items, $\alpha = 0.82$)
- Physical Capital: Assessed through infrastructure access, livestock ownership, and equipment availability (8 items, $\alpha = 0.79$)
- Human Capital: Evaluated through education levels, skills, and health status (6 items, $\alpha = 0.85$)
- Social Capital: Measured through social networks, community participation, and institutional access (9 items, $\alpha = 0.88$)
- Financial Capital: Assessed through income sources, savings, and credit access (5 items, $\alpha = 0.81$)

3.4.2 Livelihood Education Scale

Adapted from Flavell (1979) and Schraw & Dennison (1994), measuring:

- Goal orientation (4 items, $\alpha = 0.76$)
- Metacognitive knowledge (5 items, $\alpha = 0.82$)
- Metacognitive experience (4 items, $\alpha = 0.78$)
- Metacognitive choice (3 items, $\alpha = 0.74$)
- Monitoring (4 items, $\alpha = 0.80$)

3.4.3 Social Adaptation Scale

Based on Berry (1997) and Sam & Berry (2010):

- Productive adaptation (6 items, $\alpha = 0.83$)
- Life adaptation (5 items, $\alpha = 0.79$)
- Cultural adaptation (4 items, $\alpha = 0.77$)

3.4.4 Life Satisfaction Scale

Adapted from Diener et al. (1985) and Pavot & Diener (1993):

- Life needs (5 items, $\alpha = 0.86$)
- Living environment (6 items, $\alpha = 0.82$)

All scales used a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree).

3.5 Data Collection Procedure

Data collection was conducted from March 2023 to May 2024 applying standard survey administration and ethical considerations. Face-to-face interviews were conducted in the local language (Cebuano/Bisaya) and later translated to English for analysis.

3.6 Ethical Considerations

The study received approval from the Institutional Review Board (IRB) and the DNSC Ethics Review Committee. All participants provided informed consent, and data confidentiality was maintained throughout the research process.

3.7 Data Analysis

Data analysis was conducted using SPSS 28.0 and AMOS 28.0. The analysis included:

1. Descriptive Statistics: Frequencies, means, and standard deviations

2. Reliability Analysis: Cronbach's alpha coefficients
3. Correlation Analysis: Pearson correlation coefficients
4. Structural Equation Modeling (SEM): Model fit assessment and path analysis
5. Regression Analysis: Multiple regression for predictive modeling

4. RESULTS

4.1 Respondent Characteristics

The study sample consisted of 400 respondents with the following characteristics:

- Gender: 58% male, 42% female
- Age: Mean = 42.3 years (SD = 12.7)
- Education: 45% elementary, 38% high school, 17% college
- Primary occupation: 72% farming, 18% agricultural trading, 10% other agribusiness activities
- Average household size: 5.2 members

4.2 Livelihood Capital Assessment

Table 1: Frequency Distribution of Livelihood Capital Components

Capital Type	Categories	Frequency	Percentage
Natural Capital			
Land ownership (hectares)	0-6.67	212	53.0
	6.67-13.33	187	46.8
	13.33-20	1	0.3
Physical Capital			
Livestock owned	101-150	187	46.8
	151-200	213	53.3
Human Capital			
Family workers	4	188	47.0
	5	212	53.0
Financial Capital			
Annual income (PHP)	<300,000 PhP	P	46.5
	301,000-500,000 PhP	207	51.8
	501,000-700,000 PhP	7	1.8
Social Capital			
Social network size	0-50	12	3.0
	51-100	190	47.5
	101-150	169	42.3
	151-200	29	7.3

The majority of respondents (53%) own small landholdings (0-6.67 hectares), reflecting the typical small-scale nature of agriculture in GIDAs. Most households (53.3%) maintain moderate livestock holdings (151-200 animals), suggesting diversified farming systems. The predominance of 5-member households (53%) indicates stable family structures that can provide agricultural labor. Financial capital remains limited, with 98.3% of households earning less than PHP 500,000 annually. Social networks are moderately developed, with 89.8% of respondents having 51-150 close social connections.

4.3 Livelihood Education Levels

Table 2: Descriptive Statistics for Livelihood Education Dimensions

Dimension	Mean	SD	Interpretation
Goal Orientation	4.673	0.207	Very High
Metacognitive Knowledge	4.704	0.177	Very High
Metacognitive Experience	4.711	0.190	Very High

Dimension	Mean	SD	Interpretation
Metacognitive Choice	4.705	0.210	Very High
Monitoring	4.720	0.206	Very High
Overall Livelihood Education	4.704	0.100	Very High

All dimensions of livelihood education scored above 4.6, indicating very high levels across all measured aspects. Monitoring achieved the highest score (4.720), suggesting that respondents are highly skilled in tracking their agricultural activities and outcomes. The consistently high scores across all dimensions indicate that despite geographical isolation, GIDA communities have developed sophisticated indigenous knowledge systems and learning capabilities.

4.4 Social Adaptation Levels

Table 3: Descriptive Statistics for Social Adaptation Dimensions

Dimension	Mean	SD	Interpretation
Productive Adaptation	4.070	1.099	High
Life Adaptation	4.737	0.494	Very High
Cultural Adaptation	4.345	0.940	Very High
Overall Social Adaptation	4.384	0.509	Very High

Life adaptation scored highest (4.737), indicating that respondents have successfully adapted their daily life practices to their geographical and social environment. Cultural adaptation also scored very high (4.345), suggesting strong cultural preservation and adaptation mechanisms. Productive adaptation, while still high (4.070), shows the greatest variability (SD = 1.099), indicating diverse strategies for economic adaptation among households.

4.5 Life Satisfaction Levels

Table 4: Descriptive Statistics for Life Satisfaction Dimensions

Dimension	Mean	SD	Interpretation
Life Needs	3.208	0.957	Moderate
Living Environment	4.185	1.102	High
Overall Life Satisfaction	3.696	0.730	High

Interpretation: Respondents reported higher satisfaction with their living environment (4.185) compared to meeting their life needs (3.208). This suggests that while GIDA communities value their natural and social environment, they face challenges in meeting basic material needs. The overall life satisfaction score (3.696) indicates moderate to high satisfaction levels despite economic constraints.

4.6 Correlation Analysis

Table 5: Correlation Matrix between Study Variables and Life Satisfaction

Variable	Pearson r	p-value	Significance
Natural Capital	-0.018	0.725	Not Significant
Physical Capital	Not reported	-	Not Significant
Human Capital	0.001	0.978	Not Significant
Financial Capital	-0.048	0.343	Not Significant

Variable	Pearson r	p-value	Significance
Social Capital	-0.111	0.027	Significant
Livelihood Education	-0.007	0.883	Not Significant
Social Adaptation	0.024	0.637	Not Significant

$p < 0.05$

Only social capital showed a significant correlation with life satisfaction ($r = -0.111$, $p = 0.027$), indicating a weak negative relationship. This counterintuitive finding suggests that in GIDA contexts, larger social networks may create additional social obligations and pressures that paradoxically reduce individual life satisfaction.

4.7 Structural Equation Model Results

Table 6: Model Fit Statistics for Structural Equation Model

Model	R	R^2	Adjusted R^2	RMSE	F-statistic	p-value
Model 1	0.213	0.046	0.031	0.719	3.125	0.005
Model 2	0.213	0.046	0.033	0.718	3.759	0.002
Model 3	0.213	0.045	0.036	0.717	4.704	0.001
Final Model	0.211	0.045	0.037	0.717	6.165	<0.001

The final model demonstrates adequate fit with significant F-statistic ($F = 6.165$, $p < 0.001$). However, the low adjusted R^2 (0.037) indicates that only 3.7% of the variance in life satisfaction is explained by the included variables, suggesting the presence of unmeasured factors that influence life satisfaction in GIDA contexts.

Table 7: Regression Coefficients for Final Structural Model

Predictor	**β**	**SE(β)**	**t-value**	**p-value**	**95% CI**
Intercept	5.464	0.453	12.059	<0.001	[4.574, 6.354]
Natural Capital	-0.071	0.027	-2.575	0.010	[-0.125, -0.017]
Financial Capital	-2.992×10^{-6}	8.558×10^{-7}	-3.496	<0.001	$[-4.674\times10^{-6}, -1.310\times10^{-6}]$
Social Capital	-0.004	0.001	-2.756	0.006	[-0.007, -0.001]

$r=0.211$, Adjusted $r^2=0.037$, $F=6.165$, $p < 0.001$

The final model reveals that three types of capital significantly predict life satisfaction, all with negative coefficients:

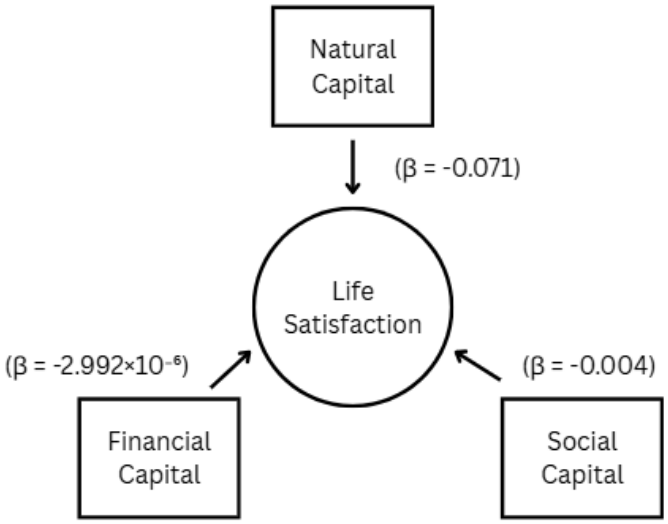
- Natural capital ($\beta = -0.071$): Larger landholdings are associated with lower life satisfaction
- Financial capital ($\beta = -2.992\times10^{-6}$): Higher income is associated with slightly lower life satisfaction
- Social capital ($\beta = -0.004$): Larger social networks are associated with lower life satisfaction

4.8 Final Predictive Model

Based on the structural equation modeling results, the final predictive model for life satisfaction in GIDA agribusiness contexts is:

Life Satisfaction = $5.464 - 0.071$(Natural Capital) $- 2.992\times10^{-6}$(Financial Capital) $- 0.004$(Social Capital)

4.9 Structural Equation Model Diagram



Model Fit: $R^2 = 0.045$, Adjusted $R^2 = 0.037$, $F = 6.165$, $p < 0.001$ $p < 0.05$, $p < 0.001$

5. DISCUSSION

5.1 Interpretation of Findings

The study's findings reveal several counterintuitive results that challenge conventional assumptions about the relationship between capital assets and life satisfaction in GIDA contexts. The negative coefficients for natural, financial, and social capital suggest that in these marginalized areas, traditional indicators of wealth and social status may not directly translate to increased life satisfaction.

5.1.1 Natural Capital and Life Satisfaction

The negative relationship between natural capital (land ownership) and life satisfaction ($\beta = -0.071$) may reflect the increased responsibilities and burdens associated with larger landholdings in resource-constrained environments. In GIDAs, larger farms may require more labor, investment, and management effort without proportional increases in productivity or income due to limited access to modern agricultural technologies and markets.

5.1.2 Financial Capital and Life Satisfaction

The minimal negative effect of financial capital on life satisfaction ($\beta = -2.992 \times 10^{-6}$) suggests that income increases have negligible impact on subjective well-being in GIDA contexts. This finding aligns with the Easterlin paradox, which suggests that beyond meeting basic needs, additional income has diminishing returns on happiness, particularly in contexts where social and environmental factors play larger roles in determining quality of life.

5.1.3 Social Capital and Life Satisfaction

The negative relationship between social capital and life satisfaction ($\beta = -0.004$) is perhaps the most surprising finding. This may reflect the social obligations and reciprocal expectations that come with extensive social networks in tight-knit rural communities. Larger social networks may create additional burdens through expected participation in community activities, mutual support systems, and social ceremonies that can strain household resources and individual time.

5.2 Theoretical Implications

These findings challenge the linear application of the sustainable livelihoods framework in GIDA contexts and suggest the need for more nuanced understanding of capital-wellbeing relationships in marginalized areas. The results support the argument that subjective well-being in traditional communities may be more closely tied to non-material factors such as cultural preservation, environmental quality, and social harmony rather than material accumulation.

5.3 Limitations and Future Research

The study's low explained variance (3.7%) indicates that important predictors of life satisfaction in GIDA contexts remain unmeasured. Future research should explore cultural factors, spiritual beliefs,

environmental satisfaction, and community governance structures as potential mediators of the capital-satisfaction relationship.

6. CONCLUSION

This study provides the first comprehensive empirical model of life satisfaction determinants in Philippine GIDAs, revealing that traditional capital assets have complex and often counterintuitive relationships with subjective well-being. The findings suggest that development interventions in GIDAs should move beyond simple capital accumulation strategies toward more holistic approaches that consider the cultural, social, and environmental contexts that shape quality of life in these marginalized areas.

The structural equation model developed in this study offers a foundation for understanding sustainable livelihood dynamics in GIDAs, though additional research is needed to identify the unmeasured factors that significantly influence life satisfaction in these unique contexts.

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