Livelihood Capital and Livelihood Strategies of Rural Households in the Qinba Mountain Impoverished Area: A Case Study of Shangluo City (Postprint)

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Abstract

Based on questionnaire survey data from rural households in the Shangluo area of the Qinba Mountains, and within the sustainable livelihood framework, this study focuses on the livelihood capital conditions among different groups, and explores the influence of household livelihood capital on livelihood strategy choices as well as the coupling of livelihood capital. The results show that: (1) Livelihood strategies of mountain households have clearly differentiated, and based on the proportion of non-agricultural income, they can be divided into four types: pure labor-migration, labor-migration-dominant, diversified, and pure agriculture. (2) The livelihood capital of households in the survey sample is limited and unbalanced, characterized by relatively high financial capital and social capital, but low natural capital and human capital. Among non-poor households, diversified livelihoods have the highest total livelihood capital value, followed by labor-migration-dominant and pure labor-migration types, with pure agriculture being the lowest; among poor households, labor-migration-dominant type has the highest total livelihood capital value, followed by pure labor-migration and diversified types, with pure agriculture being the lowest. (3) Among non-poor households, per capita cultivated land area, per capita forest land area, cultivated land quality, vocational skill level, political resources, and employment networks have positive effects on the transition of pure labor-migration households to labor-migration-dominant and diversified types, while per capita household income and proportion of male labor have negative effects; per capita household income and vocational skill level have negative effects on the transition from pure labor-migration to pure agriculture. Among poor households, per capita cultivated land area, per capita forest land area, and political resources have positive effects on the transition of pure labor-migration households to labor-migration-dominant, diversified, and pure agriculture types, while per

capita household income, labor education level, vocational skill level, and connection costs have negative effects. (4) The coupling degree of livelihood capital for non-poor households follows the order: diversified > labor-migration-dominant > pure labor-migration > pure agriculture; for poor households, the order is: diversified > pure labor-migration > labor-migration-dominant > pure agriculture. Therefore, conducting research on sustainable livelihoods of rural households is of great significance for poverty reduction among households and promoting development in rural areas.

Full Text

Preamble

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Abstract:
To study sustainable livelihoods is significant for poverty alleviation and rural area development. Based on the sustainable livelihood framework, 484 farmer households were investigated in Shangluo City of the Qinling-Daba mountainous area, Shaanxi Province, China. The survey data was used to analyze household livelihood capital between different groups by constructing the index system of household' s livelihood assets, then the impact of livelihood capital on the livelihood strategies as well as their coupling coordination degree were discussed using the Multinomial Logit regression model and the livelihood capital coupling coordination degree model respectively. The results showed as follows: (1) The livelihood strategies of rural households were obviously different. According to the proportion of non-agricultural income, there were four types of household livelihoods, namely, exclusively employed by others (Type A), employed by others most of the time (Type B), work part-time for others (Type C) and 100% doing the farmwork (Type D). (2) In the survey samples, the livelihood capital of farmers was limited and unbalanced, which presented the characteristics of relatively high financial capital and social capital and relatively low natural capital and human resources capital. Among the non-poor households, the total livelihood capital of the Type C was the highest (0.451), followed by the Type B (0.393) and the Type A (0.382), the Type D (0.215) was the lowest. While among the poor households, the Type B (0.348) was the highest, followed by the Type A (0.345) and the Type C (0.342), the Type D (0.184) was the lowest. (3) The impact of livelihood capital on the livelihood strategy choice

of non-poor households and poor households was different. For the non-poor households, the per capita cultivated land, the per capita forest land area, the cultivated land quality, vocational skill level, political resources and the employment network had a positive effect on the transformation from the Type A to the Type B and the Type C, but per capita household income and male labor ratio had a negative effect. The per capita household income and vocational skill level had a negative effect on the transformation from the Type A to the Type D. For the poor households, the transformation from the Type A to the Type B, Type C and Type D was positively impacted by the per capita cultivated land, the per capita forest land area and political resources, and the per capita household income, labor education level, vocational skill level and communication expenditure were negative factors. (4) If lining the coupling coordination degree of non-poor households' livelihood capital up in order, from the largest to the smallest we have the list as follows: the Type C (0.114), the Type B (0.106), the Type A (0.103), and the Type D (0.045). Similarly for the coupling coordination degree of poor households' livelihood capital we have the list as follows: the Type C (0.095), the Type A (0.094), the Type B (0.092) and the Type D (0.086). This study could provide useful information for the optimization of livelihood strategies and effective poverty alleviation.

Keywords: household; livelihood capital; livelihood strategy; Qinling-Daba mountainous area

1 Introduction

Sustainable livelihood analysis is crucial for poverty alleviation and rural development in impoverished regions. Based on the sustainable livelihood framework proposed by DFID, this study investigates the relationship between livelihood capital and livelihood strategies of farmer households in the Qinling-Daba mountainous area. Previous research has demonstrated that livelihood capital significantly influences households' choice of livelihood strategies, with different types of capital playing distinct roles in shaping economic activities and vulnerability to poverty.

1.1 Study Area

The study area is located in Shangluo City, Shaanxi Province, within the Qinling-Daba mountainous region. The area covers approximately 2.25×10 km², with a population of 3.765×10 . The region is characterized by its mountainous terrain, limited arable land, and high poverty incidence, making it representative of China' s contiguous impoverished areas.

3.2 Classification of Rural Households' Livelihood Activities

Based on the proportion of non-agricultural income, rural households were classified into four livelihood strategy types (Table 2). The classification system categorizes households according to their engagement in non-farm employment, ranging from those exclusively engaged in agriculture to those primarily employed by others.

Tab. 2 Classification of rural households' livelihood activities

Livelihood Type	Non-agricultural Income Proportion	Characteristics
Type A (ab7r)	90%-100%	Exclusively employed by others
Type B (b7r)	50%-90%	Employed by others most of the time
Type C (b7(243)Kr)	10%-50%	Part-time work for others
Type D (a}r)	0%-10%	100% farm work

The entropy method was used to calculate weights for livelihood capital indicators, with the formula: p = - p ln(p), where p represents the weight of each indicator.

3.2.3 Statistical Analysis of Livelihood Assets

Statistical analysis revealed significant differences in livelihood assets across household types (Table 3). The results show that Type C households had the highest total livelihood capital (0.451), followed by Type B (0.393) and Type A (0.382), while Type D had the lowest (0.215) among non-poor households. Among poor households, Type B ranked highest (0.348), followed by Type A (0.345) and Type C (0.342), with Type D lowest (0.184).

Tab. 3 Statistics of livelihood assets of different types of rural households

Household Type	Natural Capital	Physical Capital	Financial Capital	Social Capital	Human Capital	Total
Type A	0.030	0.065	0.158	0.038	0.076	0.367
Type B	0.036	0.061	0.163	0.034	0.071	0.365
Type C	0.039	0.073	0.166	0.041	0.098	0.418
Type D	0.040	0.036	0.062	0.010	0.042	0.191

4 Analysis of Livelihood Capital Impact

4.1 Comparative Analysis Between Poor and Non-Poor Households

Using SPSS software, independent samples T-tests were conducted to compare differences in livelihood capital between poor and non-poor households (Table 4). The results show significant differences ($p < 0.05$) in most capital types, particularly in financial capital ($t = 16.591$, $p < 0.01$) and human capital ($t = 15.564$, $p < 0.01$).

Tab. 4 Different analysis between poor household and non-poor household

Capital Type	Non-Poor	Poor	t-value	Significance
Natural	0.158	0.027	4.762	***
Physical	0.123	0.051	2.449	**
Financial	0.196	0.090	16.591	***
Social	0.597	0.424	11.463	***
Human	0.313	0.176	15.564	***

Note: , , indicate significance at 1%, 5%, and 10% levels respectively.

4.1.1 Natural Capital Impact

Per capita cultivated land area and forest land area showed significant positive effects on households' ability to transition from agricultural to non-agricultural livelihood strategies. For non-poor households, these factors increased the likelihood of adopting Type B and Type C strategies by 521.0% and 569.4% respectively.

4.1.2 Physical Capital Impact

Housing conditions and productive assets significantly influenced livelihood choices. Non-poor households with better physical capital were more likely to engage in non-farm employment, with the probability of adopting Type B strategies increasing by 592.1%.

4.1.3 Financial Capital Impact

Per capita household income exhibited contrasting effects: it positively facilitated transitions to Type B and C strategies for non-poor households but showed negative correlations for poor households, suggesting threshold effects in capital-livelihood relationships.

4.1.4 Social Capital Impact

Social networks and political resources emerged as critical factors. The employment network variable increased the probability of non-poor households adopting Type B strategies by 1159.7%, while political resources showed significant positive effects across all transition types.

4.2 Logistic Regression Analysis

Multinomial logistic regression models were employed to analyze factors influencing livelihood strategy choices (Table 5). The models show good fit (^{2} = 388.799, p < 0.001).

Tab. 5 Logistic regression analysis of non-poor household' livelihood strategies

Variable	Type B (vs A)	Type C (vs A)	Type D (vs A)
Natural capital	2.408***	0.385	1.826**
Physical capital	11.116***	1.469	6.210***
Financial capital	0.011***	2.524	24.339***
Social capital	2.075**	1.042	0.730
Human capital	12.597***	6.672***	790.18***

Note: , , indicate significance at 1%, 5%, and 10% levels respectively. Exp(B) represents odds ratios.

4.2.2 Human Capital Impact

Education level and vocational skills significantly affected strategy selection. For poor households, each additional year of education increased the odds of transitioning to Type B strategies by 98.5%, while vocational training increased Type C adoption by 100%.

4.2.3 Social Capital Impact

Social networks demonstrated strong positive effects. Communication expenditure, as a proxy for social capital, increased the probability of non-poor households adopting non-farm strategies by 2238.2%.

4.2.4 Coupling Coordination Degree

The coupling coordination degree model reveals the internal balance of livelihood capital (Table 7). Type C households show the highest coordination (0.114 for non-poor, 0.095 for poor), indicating better capital integration, while Type D households show the lowest (0.045 and 0.086 respectively).

Tab. 7 Coupling coordination degree of different type of household' livelihood capital

Household Type	Non-Poor	Poor
Type A	0.103	0.094
Type B	0.106	0.092
Type C	0.114	0.095
Type D	0.045	0.086

5 Discussion

The findings demonstrate that livelihood capital composition significantly influences strategy selection, with threshold effects observed across poverty statuses. Policy interventions should focus on: (1) enhancing natural capital through land consolidation, (2) improving human capital via vocational training, (3) strengthening social capital through community networks, and (4) providing targeted financial support to overcome capital constraints.

6 Conclusion

This study reveals heterogeneous livelihood strategies among households in the Qinling-Daba mountainous area, with capital endowments playing differential roles in strategy selection. The coupling coordination analysis highlights the importance of balanced capital portfolios for sustainable livelihoods. These findings provide empirical evidence for designing effective, context-specific poverty alleviation policies in mountainous impoverished regions.

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Note: Figure translations are in progress. See original paper for figures.