



A Study on the Livelihood Model of Immigrants in the Construction of Hydropower Projects in Zuojiang and Youjiang Revolutionary Old Areas Based on AMOS Software Analysis

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Abstract. The migration work of hydropower projects in the old revolutionary area of the Zuojiang and Youjiang River has certain particularities. The old revolutionary area of the Zuojiang and Youjiang River is located in the southwest border of China at the junction of Yunnan, Guizhou and Guangxi, which is a typical example of relocated migrants in the underdeveloped areas of “left-behind elderly, children, mountainous areas, poverty, disaster prone”. In the context of rural revitalization and development, it is very important to study its project construction for the livelihood development of local migrants. This study uses AMOS analysis software to construct the impact model of hydropower project construction on migrant livelihood development, and explore how the later support policies of hydropower projects have an impact on the livelihood capital endowment, livelihood capital risk, livelihood strategy choice and sustainable livelihood outcomes of resettlers. In order to verify the theoretical model, this study conducted a questionnaire survey on 412 farmers who were relocated by hydropower projects in the old revolutionary base area of the Zuojiang and Youjiang River. Based on the analysis of survey data, the structural equation model (SEM) analysis method was used to verify the various paths and assumptions of the research model, and delete some insignificant paths and the assumption of getting the ultimate theory model, which verifies and complements the theories of previous researchers, and obtains some new conclusions and policy recommendations.

Keywords: livelihood model · AMOS software · structural equation analysis

1 Introduction

The overall situation of resettlement of resettlers involved in the relocation of the hydropower project in the old revolutionary base area of the Zuojiang and Youjiang River is as follows: including Guangxi Baise water conservancy project, Tianshengqiao Level 1, Tianshengqiao level 2, Longtan, Yantan, Dahua and other large reservoir resettlers, the construction of these reservoirs involved a total number of reservoir resettlement of 32130 people. The resettlement adhere to local resettlement, and complemented by

out-of-situ resettlement. The actual relocation of 22,794 people [1]. According to the resettlement livelihood capital endowment and sustainable livelihood evaluation index constructed by Zeng Jie using the entropy method, it is pointed out that the later supportive policy has a certain positive impact on the resettlement livelihood capital endowment and the resettlement livelihood outcome [2]. But did not point out how its impact mechanism? In the face of so many reservoir resettlement populations, the formulation and implementation of supporting policies in the later period is the fundamental guarantee for the sustainable development of reservoir resettlement. Therefore, it is of great significance to study the implementation of the supporting policy in the later period of hydropower project in the old Revolutionary base Area of Zuojiang and Youjiang River and the livelihood results of migrants to find out the impact of the supporting policy on the livelihood results of the relocation of the hydropower project in the old Revolutionary Base area of Zuojiang and Youjiang River. On the basis of summarizing the impact of the support policies in the later period on the livelihood results of the relocated residents of the hydropower project in the old revolutionary area of the Zuojiang and Youjiang River, the article explores and summarizes the impact mechanism of the later support policy on the livelihood capital endowment and livelihood results of migrants. This has certain theoretical and practical significance to enrich the sustainable development of the reservoir resettlement and formulate the later support policy of reservoir resettlement in practice.

2 Literature Review

Reservoir resettlement later support policy (referred to as post-support policy) mainly refers to macroscopic guiding policies, local supporting policies and other policies related to the survival and development of the resettlement which are introduced to solve the sustainable survival crisis of the reservoir resettlement in the implementation of the national reservoir construction project, so as to achieve people-oriented, move out, be stable, and get rich so that migrants can sustainable development of the purpose. It reflects the party and the state's policy and policy of being highly responsible for immigration.

The development and improvement of the post-support policy is developed with the development of Chinese reservoir construction, at present, the construction level of medium and large reservoirs in China has reached the world's leading level. The Chinese hydropower generation accounts for $1322.0/4296.8 = 30.8\%$ of the total global hydropower generation, ranking first in the world [3]. The historical development of China's reservoir construction and post-support policies has gone through four periods, namely: 1949–1959, in embryo stage of reservoir construction. During this period, the construction of reservoirs was limited by the backward development of the economic level at that time, the construction volume was small, and the number of resettlements involved was more than 300,000 [4], the post-support policy is mainly to assist resettlements to move out. The second period was the Great Leap Forward Period of Reservoir Construction from 1958 to 1977. This period was affected by the Great Leap Forward of society, and the construction of reservoirs also started the Great Leap Forward construction, 280 large reservoirs were constructed, involving more than 10 million resettlements

[5]. During this period, due to the lack of a perfect migration policy reference, the government could only cross the river by feeling the stones, which resulted in a large number of problems in the later period of migration, such as insufficient compensation, insufficient support in the later period serious damage to the surrounding environment, and even a lot of historical issues remain. The third period is the turning period of reservoir construction from 1978 to 1990. During this period, 70 large-scale reservoirs including Gezhouba were completed, involving 720,000 resettlement [6]. Part of the projects in this period used international loans, which were in line with world standards, and the post-support policy focuses on commercial funds to support the later development of migrants. The post-support fund was relatively sufficient, and the historical problems of reservoir resettlement projects before 1985 have get the compensation treatment. The fourth period is the commercial legal period for reservoir construction from 1991 to the present. During this period, the commercial mechanisms were introduced, resulting in the Three Gorges Hydropower Project, the largest water conservancy project in the world, and more than 2 million resettlements [7]. The post-support policy during this period has become more complete in the legal system and post-support mechanism, and the resettlers could get better resettled and achieve sustainable development.

3 Construction and Analysis of Research Model Based on AMOS Software

SPSS AMOS 21.0 is a software that uses structural equations to explore the relationship between variables. It can easily conduct structural equation modeling (SEM) and quickly create models to test the interaction between variables and their causes, which is further than ordinary least squares regression and exploratory factor analysis. Structural equation modeling (SEM) is a multivariate analysis technique, which includes standard methods and expands on them. These methods include regression techniques, factor analysis, analysis of variance, and correlation analysis. Amos21.0 makes SEM easy. Its intuitive drag-and-drop drawing tools allow you to quickly customize models by the demonstration-level path diagrams without programming. Using Amos21.0 allows you to obtain more accurate and richer comprehensive analysis results than using factor analysis or regression analysis alone. Amos21.0 provides a graphical environment for each step in the process of building equation models, models can be assigned or replaced with just a mouse-click the drawing tool in Amos' palette tool and model evaluation. Examine how and why your variables interact with each other with rapid model building.

3.1 Data Sources

In order to verify the theoretical model, the research team conducted in-depth interviews and questionnaires in several large-scale reservoir resettlement sites involved in the relocation of hydropower projects in the Zuojiang and Youjiang River Old Revolutionary Base Area, such as Guangxi Baise Water Conservancy Project, Tianshengqiao Level 1, Tianshengqiao Level 2, Longtan, Yantan, and Dahua. Using random sampling method, from September to December 2020, a total of 500 samples were selected for questionnaire survey in the above-mentioned hydropower station resettlement area, and 412 valid questionnaires were finally obtained.

Table 1. Distribution of hydropower project resettlement survey reservoir area in the old revolutionary area of the Zuojiang and Youjiang River N = 412

Investigate the distribution of reservoir areas					
		frequency	percentage	Effective percentage	accumulative perception
valid	Baise Water Conservancy Project	115	27.9	27.9	27.9
	Longtan Hydropower Station	158	38.3	38.3	66.3
	Tiansheng Bridge Hydropower Station	139	33.7	33.7	100.0
	total	412	100.0	100.0	

Table 2. Demographic situation of immigrant families N = 412

74. Size of your family					
		Frequency	Percentage	Effective Percentage	Cumulative Percentage
effective	1person	3	.7	.7	.7
	2people	11	2.7	2.7	3.4
	3people	40	9.7	9.7	13.1
	4people	136	33.0	33.0	46.1
	5 or more people	222	53.9	53.9	100.0
	A total of	412	100.0	100.0	

3.1.1 Analysis of the Basic Situation of the Surveyed Objects of the Relocation of the Hydropower Project in the Old Revolutionary Base Area of the Zuojiang and Youjiang River

Investigate the Distribution of Reservoir Areas. As can be seen from the Table 1, this survey covers the main large and medium-sized hydropower stations of the old revolutionary base area of Zuojiang and Youjiang River. The number of households surveyed is also equally distributed among the three major hydropower stations.

Population of Migrant Families. As can be seen from the Table 2, 53.9 percent of the migrant families surveyed are composed of families with more than 5 members. It is more in line with the demographic structure of typical migrant rural families.

Length of Resettlement. It can be seen from the Table 3, the duration of resettlement is generally more than 3 years, which can well reflect the effect of the post-support policy

Table 3. The length of resettlement of migrants N = 412

77. Your family's relocation and resettlement time:					
		Frequency	Frequency	Effective Percent	Cumulative Percent
	3 years and below	24	5.8	5.8	6.8
	3 + years	388	94.2	94.2	100.0
	Total	412	100.0	100.0	

on the sustainable development of the resettlers, and is in line with the research time scope of the post-support policy on the sustainable livelihood of the resettlers.

3.2 Structural Equation Analysis

3.2.1 Initial Model Construction

Mainly, the AMOS structural equation analysis software is used to build the impact model of the later support policies on the livelihood capital endowment, livelihood capital risk and livelihood results of migrants, and then the questionnaire data is imported into the software, and the model calculation results are executed. According to the calculation

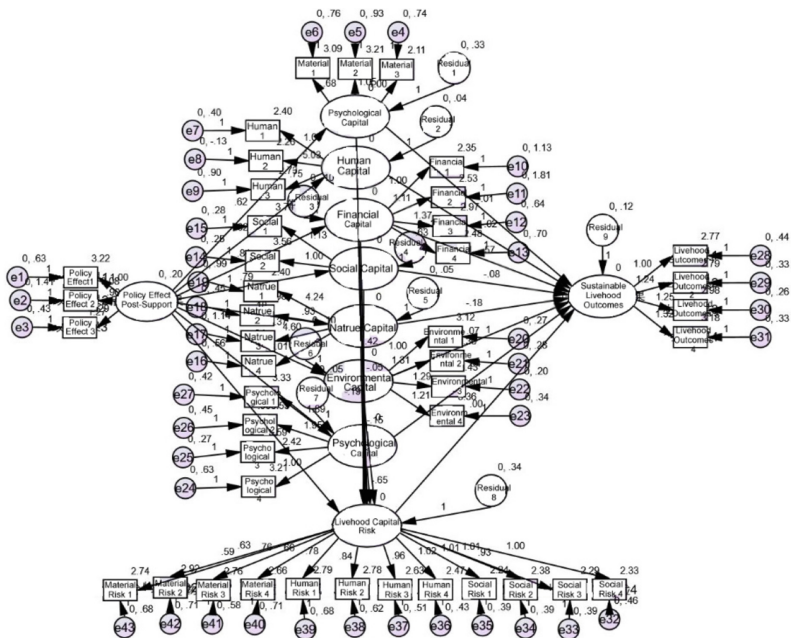


Fig. 1. The results of the operation of the theoretical model

Table 4. Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	145	2724.301	844	.000	3.228
Model	NPAR	CMIN	DF	P	CMIN/DF
Saturated model	989	.000	0		
Independence model	43	7669.125	946	.000	8.107

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.745	.602	.725	.687	.820
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.074	.071	.077	.000
Independence model	.131	.129	.134	.000

results, the coefficients of each path of the equation are shown in Fig. 1, The model includes 10 latent variables, 42 observable variables, 43 unobservable variables, and 8 intermediate variables and dependent variable residuals.

3.2.2 Model Fitting

The fitting index of the model is shown in Table 4. The CMID/DF chi-square degree of freedom value of the fitting index of the equation model is 3.228, which is between 2 and 5 in the valid range, and the approximate error RMSEA value is 0.074, which is less than 0.8 within the valid range. The Normed Fit Index NFI is 0.745, which is close to 0.8, and the CFI is 0.820, which is also close to 0.9. With reference to the range of each index of the model fitting index, it can be considered that the structural equation model has a good fit.

3.2.3 Model Determination

After deleting the paths with insignificant effects, the revised theoretical model is obtained as shown in Fig. 2.

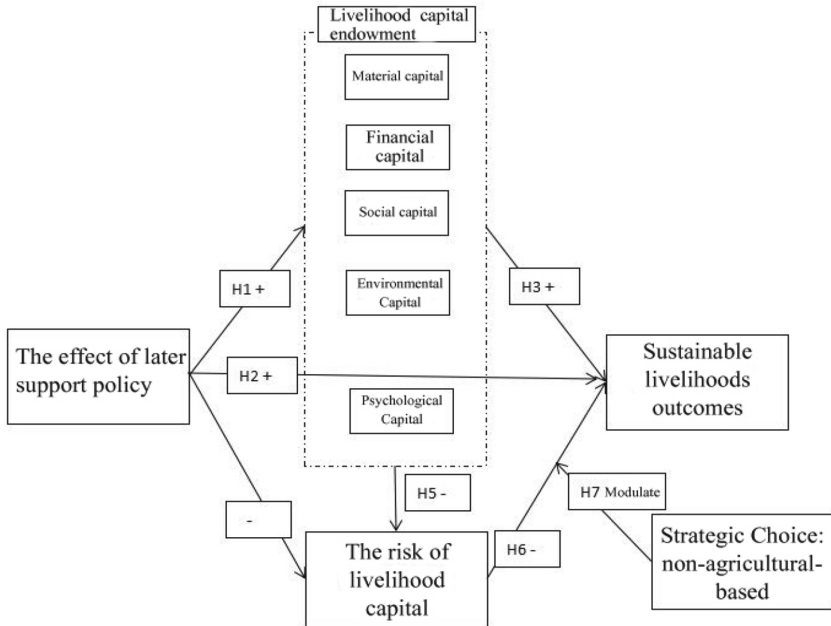


Fig. 2. Theoretical model after validation

4 Conclusion and Policy Proposal

To sum up, this study draws the following conclusions: Conclusion 1: The effect of the support policy in the later period has played a basic policy effect of “moving out and staying stable” in the resettlement of the Zuoyoujiang Hydropower Project. Conclusion 2: The effect of post-support policies has a significant positive effect on the sustainable livelihood outcomes of migrants through livelihood capital endowment, but natural capital and human capital in livelihood capital endowment have no significant effect. Conclusion 3: Livelihood capital risk plays a negative role in the effect of post-support policies and resettlement livelihood outcomes, and the choice of non-agricultural livelihood strategies can effectively adjust the effect of livelihood capital risk on resettlement livelihood outcomes.

Integrated the above research conclusion, combined with field survey personal experiences, this paper puts forward the following policy recommendations: First, the post-support policy plays a key role in restoring the livelihood capital endowment of the resettlers of the Zuojiang and Youjiang River Hydropower Project to the same level as that of other non-relocated farmers, as a result, the basic policy effect of "moving out and staying stable" has been realized. But after all, the construction of hydropower projects has led to the generation of migrants, and the construction of hydropower projects has benefited. If the resettlement merely restores production and life, and the livelihood capital endowment returns to the previous level, a win-win situation cannot be achieved. Whether the follow-up water conservancy project construction can consider whether the resettlement participates in the investment of the hydropower project construction

party in the form of land shareholding, and the hydropower project constructor regularly announce the profitability of the hydropower project, develop the affiliated industries of the hydropower project, and guide the resettlers to participate in the industrial production, so as to achieve mutual benefit and win-win results.

Second, natural and human capital in the livelihood capital endowment have no significant effect on sustainable livelihood outcomes. The possible reasons have been analyzed in the conclusion. Since natural capital is caused by objective reasons, the post-support policy can try to reduce the guidance of agricultural production, accelerate the implementation of the current rural land transfer policy, and strengthen the intensity of industrial poverty alleviation. Provide technical guidance and training for non-agricultural production in human resource training.

Third, the more effective the back-up policy is, the lower the livelihood capital risk will be and the better the sustainable livelihood outcome will be. The implementation of the post-support policy will bring certain risks to the livelihood capital endowment, and the choice of livelihood strategies will be regulated in the face of the perception of risks. When policies such as banning fish farming in cages are implemented, the risk of livelihood increases, and some migrants choose to work outside to reduce the risk of livelihood. To understand the principle, the government should formulate a risk prediction mechanism for post-support policies. And guidelines for the selection of livelihood strategies. Evaluate and adjust post-support policies in a timely manner.

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