Improvement in the Poverty Status of Ecological Migrants under the Urban Resettlement Model: An Empirical Study in China

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Abstract: As a major measure of ecological environment protection, ecological migration addresses the conflict between humans and the ecological environment. The Urban Resettlement Model is a prevalent resettlement model used by the Chinese government to try to alleviate poverty brought about by the ecological environment by promoting migration. This study initially explored the mechanism of influencing the livelihoods of relocated households in the Urban Resettlement Model by analyzing questionnaire data obtained from farmers in the resettlement area of Nangqian County. The coarsened exact matching (CEM) model was used to control the influence of confounding factors in the observation data. Next, a disordered multinomial logistic regression model was used to analyze the impact and effect of the Urban Resettlement Model on the livelihoods of the relocated non-agricultural farmers and poor relocated households. The results show that the Urban Resettlement Model has a significant promotion effect on the non-agricultural livelihoods of the relocated farmers. For all relocated households, the presence of medical facilities exhibited a significant promotion effect on the non-agricultural livelihoods of the relocated farmers. For poor relocated households, convenient transportation facilities facilitated the pursuit of non-agricultural livelihoods such as migrant work. However, industrial support, employment support, or training had no statistically significant effects on all relocated households or poor relocated households. The number of family laborers and communication costs were significant promoting influences for all relocated households and poor relocated households to engage in part-time and non-agricultural livelihoods. There was a certain impact of relocation time on livelihood choice for the relocated farmers, but there was no significant impact for poor relocated households. Based on these findings, the following suggestions are proposed. Supporting industries should be provided and industrial transformation and upgrading efforts should be strengthened during the application of the Urban Resettlement Model to create job opportunities for relocated people. Additionally, enhanced construction of basic infrastructure, including transportation, medical care, and communication systems is required. The results of this work should facilitate the effective improvement of administration of the ecological resettlement environmental protection policy system.

Keywords: the urban resettlement model; relocated farmers; livelihoods; coarsened exact matching (CEM)
1. Introduction

The ex-site poverty alleviation and relocation project is one of the key measures for developmental poverty alleviation in China and worldwide. At the same time, to protect the environment of the source of the river, it is important to restrict human activities in the local area and to migrate people to cities and towns away from the natural reserve. In 2011, an ecological resettlement project was started in the Sanjiang yuan region of China (the source of the Yangtze River, the Yellow River, and the Lancang River). With resettlement, the urbanization rate in Nangqian County increased by 4.69 percent. From 2010 to 2018, the most resettlement of ecological immigrants was based on centralized resettlement, for which the rate was 80% and with at least 60% in urban areas. At the economic level, the Urban Resettlement Model is intended to alleviate poverty among immigrants by fostering green industries. At the ecological level, reducing land-cultivation activities and reserving resources for future generations are two main measures. At the social level, through restricting the development in upstream, it provides more ecological benefits to the whole society. By optimizing the living conditions of the relocated farmers, the Urban Resettlement Model of “relying on cities and towns” in Nangqian county may also present challenges to the relocated famers, with requirements for livelihood conversion, social integration, and identity recognition. Nevertheless, China has been trying to balance ecological protection and economic development and find effective strategies to convert ecological benefits into economic benefits. Sustainable development can benefit society by expanding people’s overall well-being, with improvements to multiple dimensions of health, education, and lifestyle. In 1994, China released the first sustainable development agenda for developing countries, “China Agenda 21—China’s White Paper on Population, Environment, and Development in the 21st Century”, which incorporated goals of sustainable development into long-term economic and social development planning. The exploration of green and sustainable development from theory to practice will provide guidance for developing countries similarly seeking to balance the needs of economic development and protection of the environment.

The goal of this work is to determine the impacts and effects of the Urban Resettlement Model on the livelihoods of relocated famers. We review studies related to China’s resettlement model, and then perform an in-depth analysis of the Urbanization Resettlement Model and survey data of relocated farmers in the ecological resettlement area of Nangqian County using the coarsened exact matching (CEM) model. Based on the results, countermeasures are proposed.

2. Literature Review

2.1. The Urban Resettlement Model

China’s resettlement models for immigrants can be classified according to employment and livelihood choices, land allocation, and selection of resettlement sites (Table 1). First, according to the residential construction model, resettlement can be divided into centralized resettlement and scattered resettlement [1]. The former refers to the relocation of migrants to a new area within a certain scope (a certain region), while the latter includes work-arrangement resettlement, self-employed migrant workers, and settlement to join relatives and friends. Second, from the perspective of earning a living, resettlement modes include agricultural resettlement and labor resettlement. In a land allocation model, the modes can be divided into “resettlement with land” and “resettlement without land” [2]. Third, according to the site, resettlement can be divided into city and towns. Many migrants may only partially enter the social structure and social welfare system of a town after resettlement, with “urbanization” realized for a living environment and living conditions. Centralized resettlement communities may rely on planned central urban constructs, including cities, counties, and formed towns in which the infrastructure and public services supporting facilities and the centralized resettlement sites have been simultaneously planned and integrated. Urban resettlement is a model of concentrating the rural poor in urban areas, constructing housing for migrant farmers, and providing supporting resources, such as medical and educational, to form new resettlement communities [3]. Urbanization
of the reservoir resettlement was further divided by Shi Guoqing et al. into market town resettlement, county resettlement, and central city resettlement. Central village mode refers to relocating migrants to a central zone, which is near the center of town and has convenient transportation [4].

Table 1. Classification of resettlement methods for immigrants in China.

| Classification Criteria       | Resettlement Methods                                      |
|------------------------------|-----------------------------------------------------------|
| Access to resources          | Resettlement with land/resettlement without land          |
| Access to means of production| Government-led resettlement/self-plan resettlement        |
| Migration distance           | On-site resettlement, remote resettlement, relocation resettlement |
| Compensation method          | One-time compensation/long-term compensation              |
| Degree of aggregation        | Centralized resettlement/scattered resettlement           |
| Urban-rural division         | Rural resettlement/urban resettlement                     |

The above resettlement models have significant overlap with each other. Traditionally, China has implemented agricultural resettlement or with-land resettlement for immigrants as part of ecological protection, disaster avoidance, poverty alleviation, and engineering projects. However, due to the increasing scarcity of agricultural land resources, there has been increased implementation of urban resettlement or urbanization resettlement. Some areas in China have used reservoir resettlement models. The Shanxi Reservoir resettlement model in Wenzhou city, Zhejiang province resettled migrants to cities or market towns with a developed economy, prosperous market, and abundant job opportunities as a form of without-land resettlement, transferring agricultural registration to non-agricultural registration (China’s rural household registration and urban household registration enjoy different treatments, and the former enjoy better treatment) to facilitate life for urban residents. Another example is the Ningxia Ecological Poverty Alleviation Resettlement Project, where five resettlement models were applied: centralized resettlement by developing land, modest centralized nearby resettlement, insertion resettlement according to local conditions, resettlement of labor immigration workers, and resettlement of special institutions for the elderly (old people who have lost the ability to take care of themselves are placed in nursing homes). Niak Sian Koh et al. studied the integrated development of ecological migration and urban-rural development, concluding that the importance of agricultural conditions for ecological migration has gradually decreased, with the current ecological migration exhibiting a greater urbanization tendency. Based on this, a model of ecological migration was proposed that considered industrialization and urbanization [5].

Due to the scarcity of agricultural land resources, urban resettlement or urbanization resettlement has received increasing attention in recent years. In addition to the Sanjiangyuan immigrants, there are many other types of immigrants, such as immigrants from the Ningxia province’s “Twelfth Five-Year Plan” ecological poverty alleviation resettlement project, the Guizhou province’s ex situ poverty alleviation relocation, and the Three Gorges Reservoir immigration. Other government-supported projects to protect fragile ecology include establishing natural reserves and national parks, dividing ecological function zones, setting ecological red lines. These projects help poor local residents through restricting land opening and development and through using franchising and financial allocation compensation (a type of ecological compensation). Experts such as Richard Leete et al. [6] of the United Nations Population Development Fund have studied population, environment, and poverty issues worldwide and pointed out that population pressure is an important factor for poverty and environmental degradation to reach the limit in some regions. Professor Markos Ezra [7] of Ethiopia’s former Population Commission Policy Division also pointed out that population pressure is a key factor that causes ecological degradation and promotes ecological migration. It can be seen that the original intention of ecological migration is to protect and restore the ecological environment. Environmental factors are hence considered to be another fundamental factor that can cause large-scale population migration, in addition to political, economic, and social factors [4]. Ecological migration can prevent ecologically fragile areas from being damaged by human activities.
2.2. Sustainable Livelihood Issues of Urban Resettlement

After resettlement, migrants need to adjust to a new production and living environment. There is a direct connection between the resettlement model and migrants’ sustainable development and livelihoods. Some previous scholars also noticed the impact of different resettlement modes on the livelihood activities of farmers. For example, Zhao Xu et al. [8] analyzed the impact of out-migration agricultural resettlement on land disposal behavior and livelihood transition of reservoir migrants in the middle route of the South-to-North Water Transfer Project, and then suggested a resettlement model with no or little land. Ling-Hin Li [9] found that a centralized resettlement model significantly reduced the probability of relocation households choosing a diversified livelihood compared with the scattered resettlement model. Tian Peng et al. [10] conducted an in-depth analysis of a community in Xinxiang, Henan province based on the “urban and rural continuum” framework, concluding that new urbanized communities are characterized by integrated infrastructure and public services, diversified livelihood models, and the implementation of new community governance models.

Many scholars and experts have contributed to this research area. Shi Junhong [11] discussed the index system and evaluation method of sustainable development of ecological migration. Zhang Lijun et al. [12] studied the characteristics of livelihood strategies of ecological immigrants. Jia Guoping et al. [13] explored the changes in livelihood strategies of different types of relocated farmers and their impact on the ecological environment. Liu Hong et al. [14] evaluated the livelihood capital of ecological migrants and proposes policy recommendations for sustainable development of ecological migrants’ livelihoods. However, most of these studies are qualitative analysis—quantitative analysis based on the sustainable development of ecological individual micro-individuals, especially empirical research on the sustainable development capacity of ecological migrants under the urban resettlement model, is relatively scare. Huang Haiyan [15], who conducted empirical research in China based on the data of ecological immigrant families in Guizhou Province, used fuzzy evaluation to make an empirical analysis of the changes in the sustainable development capacity of ecological immigrants before and after relocation. Wang Lei [16] analyzed the impact of changes in livelihood capital on the income growth of relocated farmers. Overall, there are few empirical studies on large-scale data collection. Especially, there is a lack of research focusing on the protection of ecological immigrants to the environment in the Sanjiangyuan area and considering the livelihoods of immigrants. Therefore, the research content and method of this article are novel.

Some studies [3] found that the central-village resettlement model had little influence on the production and lives of relocated farmers, but the living environment was greatly improved, with higher occupancy rate, stability rate, and poverty-deprivation rate than any other resettlement model. Due to the relatively sound infrastructure and proximity to the business center, an Urban Resettlement Model can more easily transform the primary industry of rural immigration to secondary and tertiary industries [3]. Both resettlement models have their own advantages in helping migrants to earn a living. To summarize, most current studies on Urban Resettlement Models in China have been based on qualitative analysis, lacking quantitative research. Thus, the impact mechanism of Urban Resettlement Models on the livelihoods of relocated farmers remains to be further explored.

2.3. Impact Mechanism of Urban Resettlement Model on Livelihoods of Relocated Households

Urbanization is a comprehensive concept and not only includes the concentration and transformation of population and non-agricultural economic activities in cities and towns, but also the evolution of land use, values, production, and lifestyle. The Urban Resettlement Model relies on the driving effect of the town, so that relocated people in a town can get more employment opportunities, better public services, and finally move out of poverty to become rich. It is expected that migrant resettlement will be combined with urban-rural integration, to “eradicate the root” of poverty so migrants will fully enjoy the same rights enjoyed by urban residents [17]. The Urban Resettlement Model, analyzed from the perspective of the relocated households, not only reflects changes in the geographical space of the production and life of the resettlers, but also affects the
original production and living factors of the resettlers and the changes in the living infrastructure. The implementation of policy measures such as urbanization resettlement measures, resettlement compensation, and infrastructure construction can further promote the development of secondary and tertiary industries, optimize their industrial structure, and promote economic development [18].

There are several components to the Urban Resettlement Model for the relocation of Nanqian immigrants. The first and most basic level is based on geographical divisions, in which the urban resettlement site should be located in the most established urban area [19]. The relocated households moving into new towns and cities should enjoy better housing conditions (mostly apartment buildings) and better geographical locations. At the second level, urban resettlement should occur in areas with basic public service facilities, such as primary schools, kindergartens, middle schools, convenient roads, and health care. The resettlement community should establish management committees, community service centers, activity rooms for the elderly and children, and reading rooms. Construction of supporting facilities such as supermarkets; services such as fire protection, domestic garbage collection, and sewage treatment according to the population density, and policy of industrial assistance policies such as industrial support; as well as preferential employment assistance policies and training for relocated households should closely follow [20]. At the third level, relocated farmers should be fully integrated into the cities and towns where they move. In particular, relocated households should receive the same basic treatment or public services as local residents in terms of education, training, employment, social security, subsistence allowance, social assistance, and community management, as well as any benefits received from their agricultural land in the original area, homestead, or collective asset income.

The Urban Resettlement Model at these three levels has different impacts on the livelihoods of the relocated households. At the first level, compared with the Non-Urban Resettlement Model, the move of the relocated farmers from the original rural area to urban areas leads to a decrease in the cost of working. At the second level, compared with the original location, more convenient road transportation is typically enjoyed by relocated farmers in towns, making it easier to work away from home [21]. In addition to industrial assistance, educational resources and health services in cities and towns can provide opportunities and possibilities for the future development of the poor. At the third level, some aspects of the Urban Resettlement Model can change the livelihoods of the relocated farmers in a continuous and lasting way [22]. For example, the confirmation of the right to farm land is beneficial to the circulation of the right to contract and manage the land of the relocated households, and the protection of the rights and interests of resources also makes the relocated households feel more secure to “leave their land and leave their homeland”. The integration of urban and rural areas in old-age care, medical care, subsistence allowance, community management, and other social management measures will also change the thoughts and lifestyle of relocated households for a long time to come, and it also affects the choice of their livelihood activities, such as agriculture and forestry production, part-time work, and business. The Chinese government invested 7.5 billion yuan to construct the Sanjiangyuan Natural Reserve, with resettlement the main focus. Of course, the urban resettlement mode can have an impact on the livelihood activities of relocated households—some short-term effects, some long-term effects; some direct roles, some indirect roles. The implementation of the Urban Resettlement Model that relies “on the cities and towns” improves living conditions for the relocated farmers, but relocated farmers face multiple challenges, such as livelihood conversion, social integration, and identity recognition.

Based on the above three levels of resettlement connotation of urban relocation and its impact on the livelihood activities of relocated farmers, this paper puts forward the research ideas. An in-depth analysis of the Urbanization Resettlement Model, data from relocated farmers in the Sanjiangyuan National Nature Reserve, and application of the CEM model are used to determine the impacts and effects urban resettlement on the livelihoods of relocated farmers. Ideas for improvements are suggested based on the analysis.
3. Materials and Methods

3.1. Data Collection

The data were collected from a household survey of local rural households in resettlement sites (Xiangda town, Dongba Township, Jinxai township) in Nangqian county, Qinghai province by the author and research groups at Qinghai University. Stratified sampling of all settlements in Nangqian County was done by number of inhabitants. This research is one of the research projects conducted by local universities. Findings from this research will be recommended to government decision-makers through a consultancy system set up in schools. Contents of the questionnaire survey included: livelihood status before the relocation, relocation type, time of relocation, composition of family members, age and education status of family members, reason for relocation, total assets of the family and number of production tools, per capita income, debt situation, communication costs, cultivated land reservation and area status, satisfaction with the infrastructure after the relocation, future expectations, and areas that need to be improved (Figure 1). Variables were surveyed using multiple-choice items or open-ended questions [23]. A total of 682 valid questionnaires were obtained, with an effective rate of 98.06%.

![Figure 1](image-url) Outline of questionnaire design to assess the impact of the Urban Resettlement Model on the livelihoods of relocated farmers.

The questionnaire was designed to comprehensively consider the impact mechanism of the Urban Resettlement Model on resettlers, as previously proposed by other scholars. The questionnaire included questions about the social and demographic characteristics of the farmer households, natural capital such as land, family livelihood activities, income sources, and relocation time. Based on the data collected from the questionnaire, the influencing factors of the empirical analysis were selected. Among them, 369 urban resettlements accounted for 78% of the sample of relocated households, and there were 102 non-urban resettlements.

3.2. Coarsened Exact Matching (CEM) Model

The coarsened exact matching model was proposed by Lacus et al. [4]. CEM is a monotonic imbalance boundary (MIB) matching method, which means that the maximum imbalance between the participating group and the control group can be selected by the user in advance, rather than discovered by post-matching inspection and repeated re-evaluation [24]. This model maintains a balance between the covariates of two sets of data to enhance comparability, reduce the reliance on model comparability, and diminish data bias [25]. Adjusting the imbalance on one variable does
not affect the imbalance on any other variable. Before exact matching, stratification was performed according to each covariate, and then CEM was used to perform exact matching based on layers to ensure that the participating group (urban resettlement households) and the control group (non-urban resettlement households) matched at each level.

To ensure the validity of the comparison, Lacus et al. proposed the measurement method of L1, the value range of which is [0–1]. A value of $L_1 = 0$ means that the two sets of data are completely balanced. A value of $L_1 = 1$ means that the two sets of data are completely unbalanced. Thus, the closer the value is to 1, the greater the degree of imbalance. After matching, if the $L_1$ value is lower than the former $L_1$ value, this indicates that the matching effect is good. After CEM matching, the sample sizes of the two sets of data may not be equal, so a weight variable was generated during the process to balance the samples participating in urban resettlement and non-urban resettlement in each level.

3.3. Model Construction: Multinomial Logistic Regression Model

Although CEM matching reduced the dependence on the model and also partially resolved the endogenous bias caused by individual differences between the two groups, it was still necessary to use a model to control the individual characteristics of the sample after matching [1]. Using both the CEM and a multi-class logistic regression model that combines matching weights to estimate the results is more reliable and robust than a simple regression analysis. The dependent variables were pure agricultural livelihoods, diversified livelihoods, non-agricultural livelihoods. The multinomial logistic regression model is applicable to the case where the dependent variable is a categorical variable and the number of levels is greater than two. According to whether the level of the dependent variable is ordered, ordered multinomial or disordered multinomial logistic regression can be used. Here, disordered multinomial logistic regression model was used to explore the impact of the resettlement model on resettlers’ livelihood activities. The dependent variable of pure agricultural livelihoods was defined as the reference level and other forms of livelihoods were compared to it. For K independent variables, $n - 1$ logistic models were established, as follows:

$$\text{Logit}(y) = \ln \left( \frac{P(y = j)}{P(y = n)} \right) = \alpha_j + \sum_{k=1}^{K} \beta_{jk} x_k$$

In the formula, $j = 1, 2, \ldots, n$ represents $n$ different levels of $n$ dependent variables; $P(y = j)/P(y = n)$ is the probability that $y$ takes $i$ and $n$, which is called the occurrence ratio; $\alpha_j$ is the constant term of each regression equation; $\beta_{jk}$ is the regression coefficient of the respective variable, for unchanged independent variables, this is the amount of the natural logarithm of the occurrence ratio for each unit that $x_k$ changes.

3.4. Variable Selection

The main livelihoods of the surveyed relocated farmers included agricultural plantation, forestry plantation, breeding, working as an employee, and non-agricultural operations. In this study, pure agricultural livelihoods were activities by relocated famers who are only engaged in agricultural plantation, forestry plantation, or breeding, or if the family income comes only from these activities. Alternatively, working and non-agricultural operations for family income were defined as non-agricultural livelihoods. Households involved both in agricultural and forestry farming, working, or other non-agricultural operations were considered diversified livelihoods.

The control variables in this model took into account the characteristics of the household, including the socio-demographic characteristics such as the age and education of the head of household and the number of family laborers. Land is an important means of production and living for farmers, so the area of arable land owned by families was included. The logarithm of family borrowing and household per capita income was used to measure household financial capital [26]. Physical capital refers to
the means of production and materials used for production and living, which was measured by the total number of household assets, including the number of production tools such as tricycles, tractors, and pumps. In addition, the number of households that could make urgent large expenditures and the communication costs of family members last month were considered in the family’s social capital. For farmers’ relocation characteristics, relocation time and relocation reason were considered.

The livelihood capital and relocation data for relocated farmers in Urban Resettlement Model and Non-Urban Resettlement Model are shown in Table 2. As shown in Table 2, in terms of human capital, financial capital, and substance capital, there were statistically significant differences for relocated farmers in the Urban Resettlement Model and the Non-Urban Resettlement Model. Because of these differences, it cannot be concluded if the choice of livelihood activities of relocated farmers is affected by urban resettlement. To compare the impact of urban resettlement on livelihood selection of relocated farmers, the basic characteristics of urban resettlement relocated farmers and non-urban resettled relocated farmers needed to be matched using CEM methods. The age and the education level of the head of the household, the total area of the farmland, the time of relocation, and the type of relocation were selected as covariates for the CEM methods. Matching was conducted with the Stata15.0 software. After matching, the value of L dropped from 0.735 to 0.584, indicating a positive matching effect.

| Variable Description | Unmatched Means (Urban Resettlement, Non-Urban Resettlement Farmers) | Matched Means (Urban Resettlement, Non-Urban Resettlement Farmers) |
|-----------------------|-------------------------------------------------|-------------------------------------------------|
| Age of the head of the household # | Actual age 1 ≤ 45; 2 = 45~65; 3 ≥ 66 | 2.02 1.93 0.26 | 1.95 1.89 1.00 |
| Education level of the head of the household # | 0 = illiterate; 1 = primary school; 2 = junior high school; 3 = high school and above | 1.20 1.36 0.44 | 1.12 1.23 1.000 |
| Total family arable land # | Family-owned arable land/667 m² | 4.48 4.35 0.90 | 3.02 3.22 0.89 |
| Relocation time # | Survey time minus relocation time/a 1 ≤ 1; 2 = 2~4; 3 ≥ 5 | 2.05 2.08 2.02 | 2.09 2.18 1.00 |
| “relocation reason” # | 0 = Engineering; 1 = Poverty alleviation; 2 = Disaster reduction; 3 = Ecology; 4 = Other | 2.37 2.35 0.00 | 2.57 2.27 1.00 |
| Household assets | Total household assets/piece | 3.81 4.23 0.03 | 3.78 3.99 0.30 |
| Household labor | Actual number of family workers/person | 3.17 3.32 0.31 | 3.14 3.32 0.62 |
| Logarithm of net income per capita | Logarithm of annual net income per capita | 7.93 8.28 0.08 | 7.93 8.28 0.10 |
| Whether there are family loans | 1 = Yes; 0 = No | 0.64 0.68 0.52 | 0.67 0.68 0.93 |
| Communication costs last month | Communication cost per month before survey/yuan | 225.05 261.20 0.41 | 176.47 190.21 0.51 |

Notes: “#” represents the covariate of CEM; P represents the difference between urban resettlement and non-urban resettlement relocated farmers. For coarsened exact matching, univariate ANOVA was performed on continuous variables, and the chi-squared test was performed on dummy variables. The higher the cost of communication, the more complicated the family’s social relationship network.

4. Results

4.1. Income Sources of Relocated Farmers under Urban and Non-Urban Resettlement Models

There was a significant difference between the two resettlement models for the number of relocated farmers engaging in agro-forestry planting, family farming, working as migrant workers, or working in a non-agricultural management (p < 0.05, data are omitted). The urban and non-urban resettlement samples of relocated farmers and outdoor workers were 82.11% and 72.55%, respectively. (The survey obtained 471 effective relocation of farmers sample, of which 369 urban resettlements accounted for 78% of the relocation households sample, and there were 102 non-urban resettlements.) In the Urban Resettlement Model, the proportions of relocated farmers engaged in agro-forestry, breeding,
and non-agricultural management were 40.92%, 22.22%, and 13.82%, respectively. However, in the Non-Urban Resettlement Model, the proportions of relocated farmers engaged in agroforestry, breeding, and non-agricultural management were 68.63%, 41.18%, and 9.8%, respectively. In addition, according to a concatenated analysis (statistical analysis by Excel) of the sources of income of relocated farmers and different resettlement modes (the table is omitted), non-agricultural income and migrant work income made up the highest proportion for relocated farmers in urban resettlement and Non-Urban Resettlement Models, respectively. Agricultural income of non-urban resettlement farmers was much higher than that of the urban resettlement farmers, with a significant difference between the two models for agricultural and forestry income levels ($p < 0.001$).

The construction of surrounding infrastructure and public service facilities for relocated farmers varied for the different resettlement models. Overall, full coverage was achieved in terms of medical clinics and shops near the survey sites of urban resettlement communities, with 85% coverage rates for markets, kindergarten, primary school, and bus stations, but lower coverage rates of junior high school, high school, and parks. In non-urban resettlements, the coverage rates of medical clinics and shops were relatively high, but coverage rates of bus stations and high schools were lower, both below 10%. The presence of medical offices, bus stations, kindergartens, and accessibility of primary schools were significant factors in both Urban Resettlement and Non-Urban Resettlement Models ($p < 0.001$). Coverage was based on statistics released by the local Nangqên County government. The method for calculating the coverage rate of public facilities was prescribed by a government document.

4.2. Analysis Based on Multinomial Logistic Regression Model

4.2.1. Impact of the Urban Resettlement Model on the Livelihood Activities of Relocated Farmers

Based on precise matching of urban and non-urban relocated farmers, a multinomial logistic regression model was used that included urban resettlement mode, infrastructure, and industrial assistance in Model 1 and Model 2, as shown in Table 3.

Model 1 assessed if an area was consistent with the Urban Resettlement Model. Empirical results show that:

1. Compared to pure agricultural livelihood, whether it was the Urban Resettlement Model or not had no significant effect on the choice of multiple livelihoods for relocated farmers, but there was a significant increase in choosing non-agricultural livelihoods. The living environment and lifestyle of cities and towns presented obstacles to the agricultural production activities of the relocated farmers, but the Urban Resettlement Model provided more non-agricultural jobs for the relocated farmers, helping relocated farmers transition to secondary and tertiary industry employment.

2. The education level of the head of household had a significant negative impact on the choice of diversified and non-agricultural livelihoods, and the number of household laborers had a positive impact on both choices. The logarithm of the average annual income of relocated farmers had a significant positive impact on the choice of diversified and non-agricultural livelihoods. This suggests that the accumulation of financial capital increases opportunities there for non-agricultural production and operation. The availability of borrowing in households had a negative impact on the choice of diverse livelihoods. The household communication cost in the previous month had a significant impact on the choice of non-agricultural livelihoods of the relocated farmers. The land and substance capital of the relocated farmers had no significant impact on the choice of diverse livelihoods or non-agricultural livelihoods. Among the relocation characteristics, only the relocation duration had a significant negative impact on the farmers’ choice of livelihoods, which indicates that the longer the relocation time, the less likely that farmers will choose diversified livelihoods.

Model 2 incorporated related variables of infrastructure and public services and industrial assistance. Results show that only medical facilities had a positive impact on the non-agricultural employment of relocated farmers in urban resettlement, which may be because family members’ health can be safeguarded by the better construction of medical facilities, ensuring their selection of non-agricultural livelihoods. Compared with those choosing pure farming livelihoods, the educational
level of the head of household, the number of family labors, the logarithm of annual household income per capita, and the availability of borrowing in the household had a significant impact on farmers’ choice of diverse and non-agricultural livelihoods. Additionally, the communication cost in the previous month of the survey had a significant impact on the choice of non-agricultural livelihoods. Among relocation characteristics, the relocation period alone had a significant impact on the choice of diverse livelihoods.

Table 3. Multinomial logistic regression results of livelihood activity choices for relocated households after coarsened exact matching (β).

| Variable | Model 1 | Model 2 |
|----------|---------|---------|
|          | Diversified Livelihoods | Non-Agricultural Livelihoods | Diversified Livelihoods | Non-Agricultural Livelihoods |
| Urban resettlement or not (taking non-urban resettlement as reference) | 0.02 | 1.863 ** |
| Infrastructure and industrial assistance in urban resettlement | 0.713 | 2.158 + |
| Medical offices near the residence (medical care) | -1.129 | -1.233 |
| Primary school near the residence (education) | 0.509 | 1.018 |
| Bus station near the residence (transportation) | 0.918 | 0.049 |
| Industry and employment support and training or not (taking ≤45 as reference) | 0.083 | 0.265 |
| 45~65 years old | 0.374 | 0.686 |
| ≥ 67 years old | -0.885 | -0.668 |
| Age of the head of household (taking illiterate as reference) | -1.568 + | -1.484 + |
| Primary school | -1.728 | -1.633 |
| High school and above | -0.096 | -1.133 |
| Number of family labors | 1.297 *** | 0.818 ** |
| 1.946 | -0.027 |
| Number of household substance assets | 0.232 | 0.151 |
| log of per capita net income | 0.880 *** | 0.962 *** |
| Family loans or not (taking non-urban resettlement as reference) | -1.401 * | -0.730 |
| Expenses on household communication in the month before the survey | -1.728 + | -1.207 + |
| Resettlement time (taking ≤1 (one year) as reference) | 0.004 | 0.006 ** |
| 2~4a | 0.004 | 0.006 ** |
| ≥ 5a | 0.004 | 0.006 ** |
| Relocation type (taking project resettlement as reference) | -0.276 | -0.422 |
| Poverty alleviation | -0.608 | -0.963 |
| Disaster reduction (ecological others) | 12.024 | 12.362 |
| 11.707 | 12.171 |
| Family loans or not | 0.133 | 0.368 |
| Expenses on household communication in the month before the survey | 0.600 | 0.259 |
| LR chi² (38) | 139.95 *** | 129.88 *** |

Note: The reference is pure agricultural livelihood; *** p < 0.001, ** p < 0.01, * p < 0.05, + p < 0.1.

4.2.2. Factor Analyses on the Choice of Livelihood Activities of Poor Relocated Farmers

To further analyze the selection of livelihood activities of poor relocated farmers, this research divided the sample into poor households (per capita net income is less than or equal to 2855 yuan) and non-poor households (per capita net income is over 2855 yuan) based on the national standard poverty line in 2017. A matched sample of poor households was included in the multinomial logistic regression model (limited by space, model results are omitted). Similar to the results of Model 1, if the settlement was part of an Urban Resettlement Model it was part of the model. The regression results of poor households’ livelihood activity selection show that the Urban Resettlement Model significantly improved the probability of poor migrant farmers engaging in non-agricultural livelihoods by a logarithmic ratio of 1.823, indicating that compared with non-urban resettlement poor households, the urban poor resettlement households were more likely to engage in non-agricultural livelihoods. On the other hand, the education level of the head of household, the number of family labors, whether there was a loan in the family, and the communication costs in the previous month of the household survey had a significant impact on the choice of diverse livelihoods for poor relocated farmers. Loans reduce the possibility of relocating poor households to choose a variety of livelihoods, possibly because
agricultural income is relatively low, so borrowing households require non-agricultural employment to obtain more income. The number of family labors, the annual per capita income of the family, and the monthly communication expenses of the family had a significant positive impact on the choice of non-agricultural livelihoods. Finally, the relocation time and type of relocation had no significant effect on the livelihood selection of poor relocated farmers.

The results show that compared with poor relocated households who chose pure agricultural livelihoods, the construction of bus stops near residences had a significant positive impact on poor relocated farmers’ choice of non-agricultural livelihoods. The number of family labors, whether there was a loan in the family, and the communication costs in the previous month of the household survey had a significant impact on the choice of both diverse livelihoods and non-agricultural livelihoods for poor relocated farmers. However, substance capital, household arable land, and relocation characteristics had no significant impact on the choice of livelihoods. Working and non-agricultural operations for family income were defined as non-agricultural livelihoods. Households involved both in agricultural and forestry farming, working, or other non-agricultural operations were considered diversified livelihoods [8].

The Urban Resettlement Model has a significant promotion effect on the non-agricultural livelihoods of the relocated farmers. Especially for poor relocated farmers, this model can facilitate the transition to non-agricultural livelihoods, suggesting that the Urban Resettlement Model for migrants is indeed conducive to increase non-agricultural employment opportunities.

Among all the relocated households, medical facilities played a significant role in promoting relocated farmers to engage in non-agricultural livelihoods. For poor relocated farmers, convenient transportation facilities and conditions were more conducive to their choice of non-agricultural employment, such as working as migrant workers. However, more time may be required to assess the role of education in the choice of non-agricultural livelihoods for relocated farmers. Industrial or employment support and training had no significant impact on the two models.

In the two models, the number of family laborers and family communication costs had a significant positive effect on all the relocated households and poor relocated households engaging in part-time and non-agricultural livelihoods. The relocation time affected the choices of the relocated farmers’ livelihoods, but no statistically significant effect was found for poor relocated households.

5. Discussion for the Cause

As summarized above, the reasons for the results are discussed below and recommendations are made in Section 6 to address the problem.

First, an insignificant promotion effect of the Urban Resettlement Model on the pure agricultural livelihoods of the relocated farmers shows that under this model, the living of immigrants with pure agricultural livelihoods cannot be guaranteed. Resettling people from areas requiring ecological protection to cities and towns has negative effects on farmers who mainly rely on farming off their lands [27]. Although finding a job in a city or town makes life easier, not everybody can find a job in a city or town. According to the household survey data, since farmers can collect Cordyceps sinensis in Qinghai province, the income of pure farming is not necessarily lower than that of non-pure agricultural farming. Also, many immigrants generally are unwilling to leave the land where you can get herbs.

Second, among all the samples, medical facilities had a significant role in promoting non-agricultural livelihoods of relocated farmers. For poor relocated households, convenient transportation can facilitate non-agricultural livelihoods, such as migrant work [28]. Infrastructure is key to a successful resettlement project. Qinghai province is a place of vast land with poor medical and sanitary conditions, therefore farmers living in rural areas may expect better medical facilities in towns. The survey data show that due to the low temperature all year round in Qinghai-Tibet, there are more cases of frozen legs, which limits farming work and production. However, with good medicine in an urban medical environment, these diseases can be treated. As a result, more farmers can work with increased working efficiency.
The improvement of medical facilities may not be so attractive to relocated farmers of pure agricultural livelihoods because these immigrants rarely enter hospitals for treatment. It was found in the interviews that they did not integrate well with urban life and knew little about medical facilities [29]. Also, according to them, most of the original agricultural production has stopped, so the effect of medical facilities is not so obvious. However, transportation facilities indeed effectively improved the living standards of immigrants by making travel more convenient. However, an increase in the number of migrant workers can reduce job opportunities, which will make it difficult for local poor migrants to work and get out of poverty.

Third, industrial support or employment support or training showed no statistically significant effect on all relocated households or poor relocated households. This was surprising. Although there is interest in the development of new industries in Nangqian County after immigration, there may not be positions for new immigrants [30]. Therefore, employment support and training related to industrial development may fail to benefit local immigrants.

Fourth, the number of family laborers and communication costs play a significant role in promoting part-time and non-agricultural livelihoods for all relocated households and poor relocated households. A higher number of family laborers may indicate young laborers who may select non-agricultural livelihoods [2]. If the amount of labor represents human capital and the amount of communication costs represents social capital, then higher costs indicate richer social relationships available to the family, which can provide support for relocated households to participate in urban work and get out of poverty. However, families lacking these resources may require more assistance, but some poor people may not get help [10].

Fifth, the relocation time has a certain impact on relocated farmers’ choices of livelihoods, but it has no significant effect for poor relocated households. The time of resettling will affect job availabilities, with later resettlers failing to obtain jobs. However, immigrants that move later may have more choices with the continuous development of the town over time.

Currently, the Urban Resettlement Model has basically achieved urban living conditions and environment, but basic public services, social management, land system, and social security remain at the “rural” level. Overall, the impact of the Urban Resettlement Model on the livelihoods of relocated households in the survey area remains to be seen.

6. Proposed Strategies

Economically, based on a components analysis of the choices of livelihoods of relocated people, relocated farmers require time to get used to life in a city or town. During the process of resettlement, farmers should be allowed to continue part of their agricultural livelihoods and then gradually adapt to urban life. Otherwise, there will be a huge gap between the pure agricultural resettlers and the non-pure agricultural resettlers, which limits the effectiveness of the precise poverty alleviation project. Although ecological immigration is based on the consideration of protecting ecologically fragile areas, this process should not deprive farmers of their development rights. Development right is the right of individuals, peoples, and states to participate actively, freely, and meaningfully in and enjoy equitably the benefits of development [31]. The right to development as a basic human right has gradually been recognized by the international community. Limiting the ability of Tam Giang’s indigenous people to take advantage of their environment is in part limiting their right to pursue their own interests. It is necessary to balance the needs of the residents and the need to protect the environment, such as by gradually moving people from their original place of residence to an area near a town. Another strategy is to take advantage of agricultural transformation and upgrading or concentrating agricultural production to provide basic jobs for pure agricultural farmers. Current industrial assistance is not sufficient. One solution is to actively encourage local factories to provide more job opportunities for resettlers. More precise policy support to encourage industrial assistance may also be effective [27]. Additionally, improving the human capital of farmers through vocational education or skill training can help relocated farmers obtain non-agricultural employment. Transferring the use of land or revitalizing
land and other assets of relocated farmers in the relocated area is also a good strategy to increase the income of relocated farmers. It is necessary to fully consider any differences in the family structure and employment ability of the relocated population by the implementation of customized assistance to first relocate farmers who are able to find non-agricultural livelihoods. The poor population who lack labor ability and rely only on agriculture should be resettled to the nearest central village and provided industrial assistance to adapt to local conditions.

Socially, instead of restricting based on geography and pre-existing supporting infrastructure, urban resettlement should include the construction of comprehensive supporting facilities. Among the basic supporting infrastructure (education, medical care, and transportation), the practical needs of daily life should be analyzed. For instance, in terms of the improvement of medical care, multiple locations of medical care should be provided to make sure that elderly people can access convenient medical care and timely treatment. Although improvements in transport facilities may result in a loss of labor, it is easy for people to move to large cities. However, cities can also get capital, technology, and talent from outside by tilting their policies, such as tax breaks and incentives for talent [32]. For example, based on its special geographical environment, the Nangqian County could develop eco-tourism, green agriculture, handicraft industries, or increase the added value of products to extend the industrial chain, but implementation requires convenient transportation. Although the survey data showed no impact of the educational level of farmers, as an important part of infrastructure construction, education should be vigorously developed, since cultivating high-quality talent is an important cornerstone of creating human capital for regional development. Besides, the introduction of Internet intelligent management mode would greatly reduce the management costs, being more convenient for residents [33].

Legally, to improve laws and regulations related to the environmental protection of ecological immigrants and actively implement environmental protection policies, the government must take the lead and impose laws and regulations to regulate illegal acts [34]. To this end, it is recommended to improve the "Environmental Protection Law of the People’s Republic of China”, through incorporating the environmental protection policies of ecological immigration and related ecological compensation systems, so as to make up for the lack of higher-level laws. Other recommendations are improving the legislative level, upgrading the “Regulations on Returning Farmland to Forests” (administrative department) to “Law on Returning Farmland to Forests” (legislature), and then making comprehensive and systematic changes to the environmental protection policy of ecological resettlement. Relevant departments shall regulate those lower-level policy documents and delete repeated parts to maintain the formativeness and authority of the legal system [35].

Culturally, it is proposed to preserve the diversity of minority cultures and actively cultivate new community cultures. At present, the construction of public cultural infrastructure is being accelerated. The author found in the survey that the embedded public culture of the immigrant community is mainly reflected in the creation of modern physical spaces such as cultural squares, rural bookhouses, cultural activity centers, libraries, senior universities, children’s happy homes, and psychological service stations. At the same time, taking advantage of the hidden governance cultural park based on slogans and symbols which take “building a harmonious community” as its core to displays and publicizes policies and regulations, filial piety culture, marriage and childbearing culture [36]. Residents are able to experience the power of culture and population through slogans, display boards, wall charts, and color paintings during fitness and entertainment. The community makes full use of major festivals or themed events to organize comprehensive cultural activities such as fun games, cultural performances, and nostalgia-recalling activities. Residents participating in activities can enhance mutual exchanges and the cultural atmosphere of the community can be enhanced.

Environmentally, suggestions are to carry out the activity of returning farmland to forests and research on the domestication of wild Chinese herbal medicine [37]. Through the implementation of environmental impact assessment and regular post-assessment work, it is ensured that the impact of local industries on the environment is controlled to a small extent. Through cultural cultivation,
community members can full-play their initiatives and actively participate in environmental protection. For example, cultivating among the residents the thought that people living in harmony with nature.

7. Conclusions

From the perspective of human development, sustainable development should emphasize the sustainability of the quality of human life and viable capabilities. Intergenerational justice and intra-generational justice are two indispensable principles of sustainable development [38]. Hence, sustainable development, for contemporary people and future generations, should be defined as the equal ability to obtain benefits. Since it is impossible to understand the preferences and interests of future human beings, we can only discuss sustainable development in the sense of protecting the ability to create welfare [39], while intragenerational justice is to achieve feasible capabilities as much as possible. Amartya Sen [40] states that poverty must be seen as a deprivation of basic capabilities, not just low incomes. The development of economy cannot outweigh the responsibility of protecting the environment, otherwise local residents will be disappointed. This paper attempted to protect the development ability of local residents through ecological compensation (funds, technology, manpower, information, etc.). As the old Chinese saying goes “Teaching one to fish is better than directly giving one fish”—a sustainable way is to try to establish an industrial chain with less ecological damage in the local area, and promote the environmental protection of the community based on the cultural cultivation.

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