Abstract: After the completion of China’s poverty alleviation task in 2020, the poverty situation will undergo major changes, and the focus of poverty alleviation work will shift to solving relative poverty. This can provide useful inspiration for the government to formulate and implement relevant policies that explore the differences in livelihood risk impacts of different types of farmers in areas where disasters and poverty are intertwined. This study used survey data of 327 households in four districts and counties in the hardest-hit areas of the Wenchuan Earthquake and Lushan Earthquake in China’s Sichuan Province in 2018. This study measured farmers’ livelihood risks from four aspects: health risks, environmental risks, financial risks, and social risks, and measured farmers’ poverty types from three aspects: absolutely poor farmers, relatively poor farmers, and non-poor farmers. It systematically analyzed the four types of livelihood risks faced by farmers and the three types of poverty they were in, and constructed a multinomial logistic regression to explore the correlation between livelihood risks and poverty types. This study is the first to compare the relatively poor type with other poverty types. The second innovation is that it uses the entropy method and multinomial logistic regression. The results showed that: (1) Among the four livelihood risks faced by farmers, the biggest was the environmental risk, the next was financial risk, the third was health risk, and the last was social risk. (2) Among the three poverty types, farmers in absolute poverty were the most populated, with non-poor farmers next, and relatively poor farmers at the bottom. (3) Farmers of different poverty types were affected by livelihood risks to different degrees. Specifically, when compared with the impacts on farmers in absolute poverty, the impacts social risks could bring to farmers in relative poverty were more severe while the impacts of health risks, environmental risks and financial were not that strong. Impacted by social risks, relatively poor farmers are more seriously impacted by public affairs and social security status. When compared with the impacts on non-poor farmers, the impacts of all these four risks on relatively poor farmers were not notable.

Keywords: relative poverty; livelihood risk; Sichuan Province; China

1. Introduction

Poverty is a major problem faced by economic and social development in the world. Eliminating poverty is the common task of human social development [1], and many governments and international organizations regard poverty reduction as their primary goal [2]. Since the United Nations implemented the first “Ten-Year Development Strategy” in the 1960s, the international community has been committed to global poverty governance and has achieved great results. According to statistics, the number of people living in extreme poverty in the world has dropped from 1.895 billion in 1990 to 736 million in 2015, and the poverty rate has dropped from 35.85% to 10.7% [3]. Absolute poverty governance has achieved remarkable results, but it also faces major challenges. First, the 1.9 dollar poverty standard does not reflect the full picture of poverty. There are still 1.3 billion people in the world in “multidimensional poverty” [4], and the problem of relative poverty is still
prominent [5]. Second, poverty governance is still facing a severe crisis of returning to poverty. Due to the impact of Corona Virus Disease 2019, about 114 million jobs have been lost globally, and about 120 million people have fallen into extreme poverty [6]. Even in a wealthy society, the prevalence of poverty will have a negative impact on individuals and society [7], not only in economic deprivation [8,9], but also in politics, culture, society and so on. For example, the uneven distribution of income and the increase in the poor will promote economic crises [10]; poverty as a limited citizenship [11] makes the poor lack the economic capital to participate in politics [12], and seriously undermines the rationalization of democratic politics [13]; poverty will lead to the prevalence of various opportunistic cultures [12]; in countries with serious polarization between the rich and the poor, drug use is rampant and the homicide rate is higher [14], and minors will also be adversely affected [15–17]. Therefore, the characteristics of different poverty types and their assistance strategies have gradually attracted the attention of academic and political circles, and relevant research is urgently needed.

Poverty classification is the focus of academic research [18]. Poverty is generally classified as absolute poverty and relative poverty [19–23]. Absolute poverty is manifested as the lack of material basis for reproduction of individuals or families [24]. The World Bank defines absolute poverty as “the lack of the ability to reach the minimum living standard” [25]. The concept of relative poverty was put forward by the British scholar Peter Townsend [26]. He defined relative poverty as when individuals, families, and social organizations lack resources, leading to their living below the median level and being excluded from normal lifestyles and social activities. The classification of poverty can optimize the allocation of resources and build a diversified and precise poverty alleviation system. Therefore, it is necessary to classify the poverty types of farmers.

Livelihood risk refers to the damage to the livelihood capital of farmers, leading to difficulties in their lives. Livelihood risks are closely related to livelihood capital. Many empirical studies have proved that the improvement of farmers’ livelihood capital can alleviate poverty [20,27,28] and strengthen farmers’ ability to cope with livelihood risks. On the contrary, the lack of farmers’ livelihood capital causes farmers to fall into poverty, which increases the risk to livelihoods [29], and livelihood capital has a significant positive impact on farmers’ livelihood risks [30]. For example, Addison and Brown [31] used the sustainable livelihood method and found that the poorer a family, the more united its livelihood capital structure, and the weaker its ability to cope with livelihood risks. Papa [32] believed that the financial and physical capital owned by farmers will affect their ability to cope with livelihood risk portfolio capital and play an important role in coping with livelihood risks. Scoones [33] believed that under the attack of multiple internal and external risks, farmers’ pensions are extremely vulnerable, which may cause the elderly in rural areas to fall into the situation of no financial source, no one to take care of their life and lack of end-of-life escorts. Su and Shang [34] believed that the increase in financial capital and human capital will help strengthen farmers’ ability to resist risks. Establishing a sound risk aversion mechanism, improving the social security system, and reducing the risk of farmers’ livelihoods is conducive to improving the living standards of farmers, promoting the sustainable development of farmers’ livelihoods, and playing an important role in economic and social development. However, regarding the research on farmers’ livelihood risks, most scholars at home and abroad focus on livelihood capital investigation, livelihood risk identification, livelihood risk avoidance, etc. [35]. There are few systematic studies on the correlation between farmers’ livelihood risks and poverty types, and relevant research is urgently needed.

China is one of the countries with the worst natural disasters in the world [36,37]. From the perspective of earthquake disaster zoning, seventy-four percent of provincial capital cities and sixty-two percent of cities above prefecture level are located in dangerous areas with earthquake intensity above VII. Many residents are deeply affected by disasters and fall into poverty [38], and what is more, their lives will be greatly threatened. The terrain of Sichuan Province is complex and diverse, with high altitude differences, frequent natural
disasters, extremely poor natural conditions in the “three regions and three prefectures” of the province, and the heavy task of poverty alleviation, which is the “weakness of the shortcomings”. As of the end of 2018, Sichuan Province had more than 700,000 poor people, 1,782 poor villages, and 38 poor counties. The cost of poverty alleviation was high and poverty alleviation was difficult.

In 2020, the Central Committee of the Communist Party of China and the State Council’s Opinions on Doing a Good Job in the “Three Rural Areas” and Ensuring a Well-off Society as Scheduled stated that after the completion of the poverty alleviation task, China’s poverty situation will undergo major changes and the focus of poverty alleviation work will shift to solving relative poverty. The work mode of poverty alleviation has been adjusted from concentrated operations to normal progress. 2020 is a decisive year for achieving a well-off population in an all-round way. China has lifted the rural poor from poverty under the current standards, and all poor counties have taken off their hats. After achieving absolute poverty alleviation, the focus of China’s poverty alleviation work will gradually shift to relative poverty [39]. Therefore, clarifying the livelihood risks faced by farmers of different poverty types and proposing targeted policy guidance is of great significance to China’s poverty alleviation and international poverty governance.

Based on the above theory and policy background, this study used survey data of 327 households in four districts and counties in the hardest-hit areas of the Wenchuan Earthquake and Lushan Earthquake in China’s Sichuan Province in 2018. In this study, we measured farmers’ livelihood risks from four aspects: health risks, environmental risks, financial risks, and social risks, and measures farmers’ poverty types from three aspects: absolutely poor farmers, relatively poor farmers, and non-poor farmers. We systematically analyzed the four types of livelihood risks faced by farmers and the three types of poverty they were in, and constructed a multinomial logistic regression to explore the correlation between livelihood risks and poverty types. It is hoped that this study can provide useful enlightenment for the effective connection of government poverty alleviation and rural revitalization in formulating and implementing relevant policies.

2. Theoretical Development

2.1. Poverty Types

Under the mainstream classification method, poverty is divided into absolute poverty and relative poverty [19–23]. Relative poverty refers to the state of relying on the legal income of an individual or family to maintain their food security, but are unable to meet the most basic other life needs. Absolute poverty is essentially caused by the lack of material wealth, while relative poverty is caused by the imbalance between development and distribution [40]. In this sense, absolute poverty can be eliminated, but relative poverty will only ease, not be eliminated [21,41]. Whether in developed or developing countries, relative poverty will exist for a long time. Poverty classification can provide policymakers with targeted information to facilitate the formulation of reasonable policies and measures. However, different scholars have proposed different methods for the classification of poverty types. Knight and Shi [42] divided poverty into income and consumption, income not consumption, and consumption not income. Liu et al. [43] divided poverty into eight types: human capital poverty, financial capital poverty, infrastructure poverty, human infrastructure poverty, financial infrastructure poverty, living conditions poverty, livelihood poverty and development conditions poverty. Sarwosri et al. [44] divided poverty into near poor, poor, and very poor.

2.2. Livelihood Risk

Risk refers to the uncertainty of the return or cost between the purpose of production and the results of labor. The definition of livelihood risk involves opportunities for injury, damage or loss [45]. The existence of livelihood risks will hinder the sustainable livelihoods of farmers and the sustainable development of rural society. Therefore, the issue of livelihood risks for farmers is regarded as the most important issue in rural society [35].
recent years, the academic community has paid more and more attention to the livelihood risks of farmers. Scholars at home and abroad have mainly focused on the migration areas, disaster areas, ecologically fragile areas and poverty-stricken areas. This study selects the four counties and districts intertwined with the hardest hit by the earthquake in Sichuan Province as the study area to study the livelihood risk status of farmers in both the disaster area and the poor area.

There is no uniform standard for the division of livelihood risks. The Department For International Development (DFID) categorized farmers’ livelihood risks into livelihood capital risk, livelihood strategy risk and livelihood outcome risk. Sarker et al. [46] based their study on the sustainability analysis framework and divided farmers’ livelihood risk into human capital risk, natural capital risk, financial capital risk, physical capital risk, social capital risk and livelihood strategy risk. Jin et al. [47] defined farmers’ livelihood risks as including environmental risks, health risks, financial risks, social risks, and information risks. Nguyen et al. [48] classified farmers’ livelihood risks according to the source of livelihood risks, which were divided into natural risks, market risks, health risks, education risks, employment risks, economic risks, pension risks, and policy risks. In China, the methods of dividing livelihood risks are not the same. For example, Chen [49] introduced a risk and vulnerability framework, and believed that farmers’ livelihood risks include asset risks, income risks and welfare risks. Zhao et al. [50] summarized farmers’ livelihood risks into natural risks, farmland risks, health risks, pension risks, market risks, education risks, employment risks and policy risks. This study refers to Dercons [51], Quinn et al. [52] and Su et al. [53] for the establishment of quantitative indicators of livelihood assets, and based on the actual situation of the region, it is measured from four aspects: health risk, environmental risk, financial risk and social risk.

2.3. Relative Poverty Line

Relative poverty has the characteristics of dynamic, relativity, inequality and subjectivity [54]. It should be distinguished from absolute poverty and different identification standards should be set [26]. The academic circles mainly use the following methods to identify relative poverty. The first method is the median income level measurement method. For example, the relative poverty line in France is fifty percent of the median national income [55], but this method requires huge data and is difficult to implement. The second method is the standard measurement method of poverty deprivation, which is a comprehensive assessment of poverty based on the different levels of deprivation of various indicators. For example, Lund and Townsend [56] compiled 60 indicators including diet, housing, and education to measure subjective and objective deprivation indexes, but the indicator system of this method is complex to construct and difficult to formulate policies. The third method refers to the Martin method proposed by economist Martin Ravallion, and obtains the relative poverty line according to the income distribution of residents [21,57]. This method is easy to operate and less difficult to implement. Based on the comparison of the above several methods, we selected the Martin method to identify relative poverty, and determined that the relative poverty standard range of Sichuan Province in 2018 is [4692.5, 7380.6] yuan. Since China’s absolute poverty line in 2018 (3535 yuan/person-year) did not fall within this range, the relative poverty standard range was expanded to [3535, 7380.6].

2.4. Theoretical Analysis and Research Hypothesis

The farmers’ livelihoods will be affected by uncertain factors, and the livelihood risks constituted by these uncertain factors are the core source of poverty [58]. Different poverty-type farmers face different livelihood risks, and they will also be impacted and affected to different degrees.

Farmers face health risks in terms of inherited or serious diseases, and imperfect medical systems in village hospitals. Compared with other farmers, poor farmers are more susceptible to major diseases and other health risks [59], which will damage their
income-generating ability [60]. For example, Chen [49] found that poor farmers will lose their ability to work due to illness or lack of better treatment, which will cause catastrophic impact on family income; Hu et al. [61] found that low-income farmers do not go or go to the doctor less when they are sick, which leads to an increased risk of illness; Quinn et al. [52] found that poor farmers do not have the ability to resist risks, and are more impacted by common risks such as diseases and livestock deaths [62] and external risks. Based on this, we developed research Hypothesis H1:

**Hypothesis 1 (H1).** There are significant differences in the impact of different types of poor farmers on health risks. Non-poor farmers are less affected by health risks, and poor farmers are more affected by health risks.

Farmers face environmental risks such as extreme weather, geological disasters, environmental pollution, pests and diseases [59], which are the main risks in agricultural scale operations. This will make farmers fall into poverty [63,64]. Climate change and environmental conditions in poverty-stricken areas will cause continuous livelihood risks [65], and poor farmers are often in the first place to bear the brunt of natural disasters [66]. For example, Yang et al. [67] found that most of the poor farmers live in mountainous areas with poor natural conditions, lack of water and land resources, and inconvenient water for domestic use; Shameem et al. [68] found that poor farmers are more susceptible to environmental risks and suffer greater risks to food and water safety; Peria et al. [69] found that the main agricultural risk is climate, and the financial status determines the ability of farmers to cope with climate risks, and poor farmers will be more affected by environmental risks; Luo et al. [70] found that farmers in poverty-stricken areas have weak environmental awareness and adopt unreasonable methods to develop resources, regardless of the ecological environment and human settlements, and are greatly impacted by environmental risks. Based on this, we developed research Hypothesis H2:

**Hypothesis 2 (H2).** There are significant differences in the impact of different types of poor farmers on environmental risks. Non-poor farmers are less impacted by environmental risks, and poor farmers are more impacted by environmental risks.

Farmers face financial risks such as price fluctuations of agricultural products [71], financing difficulties [72], shortage of funds [73], and lack of market information, and poor farmers are greatly affected. For example, Li et al. [74] found that the price fluctuation of agricultural products will make the per capita net income of poor farmers change more than that of non-poor farmers; Gao and Yan [75] found that poor farmers have a small production scale and weak ability to avoid risks; Feder and Nishio [76] found that poor farmers’ credit and funds are not as good as other farmers, which will make it difficult for poor farmers to obtain loans from financial institutions; Jiao et al. [77] found that poor farmers have less farmland available for mortgage, so less financing is available; Papa [32] found that the financial capital owned by farmers will affect their ability to cope with livelihood risks, and farmers with good economic conditions are more capable of coping with financial risks. However, some scholars pointed out that poor farmers have limited livelihood capital, so they are less impacted by financial risks. For example, Lucas and Pabuayon [78] found that compared with resource-rich farmers, resource-poor farmers have almost no losses or gains. Based on this, we developed research Hypothesis H3:

**Hypothesis 3 (H3).** There are significant differences in the impact of financial risks on different types of poor farmers. Non-poor farmers are less impacted by financial risks, and poor farmers are more impacted by financial risks.

Social risks are mainly caused by farmers’ lack of health protection, self-development and awareness of social participation [79]. Many decisions that affect individual risk tolerance are social. Poverty will increase the vulnerability of social capital [80] and weaken
the ability of farmers to connect with society [81]. Poor farmers will be more affected by social risks. Farmers with higher incomes have more social resources and better social relationships [82], and are less impacted by social risks. But there are also studies that show that poor families are more actively involved in public affairs. Some poor families have poor physical capital, human capital, and financial capital, and they invest a lot of energy in social participation in order to improve other capital conditions through the increase of social capital [72]. Based on this, we developed research Hypothesis H4:

**Hypothesis 4 (H4).** There are significant differences in the impact of different types of poor farmers on social risks. Non-poor farmers are less impacted by social risks, and poor farmers are more impacted by social risks.

Finally, the mechanism of livelihood risks and poverty types can be seen in Figure 1.

**Figure 1.** Livelihood risk and poverty type mechanism diagram.

### 3. Materials and Methods

#### 3.1. Data Sources

The data used in this research mainly comes from the questionnaire survey conducted by the research team in the four districts and counties of Beichuan County, Pengzhou City, Lushan County, and Baoxing County in the hardest-hit areas of the Wenchuan Earthquake and Lushan Earthquake in Sichuan Province in July 2019 (Figure 2). Thirteen researchers with strict training conducted one-on-one interviews with farmers in their homes and each questionnaire took 1–1.5 h to complete. The survey mainly included: (1) basic information on the farmers including gender, age and education; (2) household livelihood capital including income sources and social networks; (3) livelihood risks faced by farmers including health risks, environmental risks, financial risks, social risks.

To make sure that the survey captured a representative sample of the population, samples were selected with the use of stratified and probabilistic random sampling methods, which specifically refers to Zhou et al. [83,84], Ma et al. [85], Qing et al. [86], and Zhuang et al. [87]. Through stratified sampling, 16 villages in 8 townships, across the 4 districts were selected. In each sample village, 20–23 farmers were selected as sample farmers based on a random number table. Finally, 327 valid questionnaires were obtained from 16 villages, 8 townships and 4 districts.
Figure 2. Distribution of sample villages.

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3.2. Measures

3.2.1. Livelihood Risk

Regarding the measurement of livelihood risk, this study mainly refers to the establishment of quantitative indicators for livelihood risks in Dercons [51], Quinn et al. [52] and Su et al. [53]. Combined with regional reality, it is measured from four aspects: health risks, environmental risks, financial risks and social risks. Among them, health risks are generally measured in terms of family members’ illnesses, external environment and medical conditions; environmental risks are generally measured in terms of extreme weather, geological disasters, water shortages, and pests and diseases; financial risks are generally measured in terms of price fluctuations of agricultural products, fake agricultural products, shortage of funds, and errors in business strategies; Social risks are generally measured from the social network of farmers, social status, and social security status. The specific measurement indicators are shown in Table 1.

Table 1. Evaluation index system of farmer’s livelihood risk.

| Risk Dimension | Risk Variable         | Variable Definition and Description                                      | Mean | Standard Deviation | Weight |
|----------------|-----------------------|--------------------------------------------------------------------------|------|--------------------|--------|
| Health risk    | Risk of illness       | Whether you have a genetic disease or a serious disease (No = 0, Yes = 1) | 0.33 | 0.47               | 0.054  |
|                |                       | Whether suffering from livestock plague, dysentery or diseases caused by major industrial pollution (No = 0, Yes = 1) | 0.10 | 0.30               | 0.033  |
|                | External environment  | Whether the medical system of the village health center is perfect (No = 0, Yes = 1) | 0.48 | 0.50               | 0.080  |
### Table 1. Cont.

| Risk Dimension   | Risk Variable                      | Variable Definition and Description                                                                 | Mean  | Standard Deviation | Weight |
|------------------|------------------------------------|------------------------------------------------------------------------------------------------------|-------|--------------------|--------|
| **Environmental risk** |                                    |                                                                                                      |       |                    |        |
|                  | Extreme weather                    | Whether extreme weather (such as heavy rainfall, freezing) has an impact on production and life (No = 0, Yes = 1) | 0.70  | 0.46               | 0.119  |
|                  | Geological disaster                | Whether geological disasters (such as earthquakes, landslides and mudslides) have an impact on production and life (No = 0, Yes = 1) | 0.80  | 0.40               | 0.152  |
|                  | Pests and diseases                 | Have you encountered the impact of plant diseases and insect pests (No = 0, Yes = 1)                  | 0.48  | 0.50               | 0.074  |
|                  | Water shortage                     | Whether water resources can meet the basic needs of production and life (No = 0, Yes = 1)             | 0.94  | 0.23               | 0.030  |
|                  | Soil erosion                       | Degree of soil erosion (Very not serious = 1, Not serious = 2, General = 3, Serious = 4, Very serious = 5) | 2.83  | 1.36               | 0.027  |
| **Financial risk** | Agricultural product price fluctuations | Whether agricultural production has been impacted by price fluctuations of agricultural products (No = 0, Yes = 1) Have you ever encountered fake agricultural products (such as fake pesticides, fake fertilizers) in agricultural production (No = 0, Yes = 1) | 0.30  | 0.46               | 0.051  |
|                  | Fake agricultural products        |                                                                                                      | 0.16  | 0.36               | 0.038  |
|                  | Shortage of funds                  | Is there a lack of funds to expand the scale of agricultural production (No = 0, Yes = 1)            | 0.65  | 0.48               | 0.107  |
|                  | Financing conditions               | Is it difficult to obtain bank loans and financing (No = 0, Yes = 1) Whether there are mistakes in business strategy decision-making that bring losses to family economy (No = 0, Yes = 1) | 0.56  | 0.50               | 0.088  |
|                  | Business strategy decision         |                                                                                                      | 0.22  | 0.42               | 0.043  |
| **Social risk**  | Public affairs                     | Have you participated in the village public affairs decision-making (No = 0, Yes = 1)                | 0.77  | 0.42               | 0.044  |
|                  | Social security status             | Whether the lack of basic security (pension, medical insurance, etc.) leads to poor livelihood (No = 0, Yes = 1) | 0.38  | 0.49               | 0.060  |

#### 3.2.2. Poverty Type

Referring to the research of Ravallion and Chen [19], Sarwosri et al. [44], Zhou and Ye [23] and Zheng [22], according to the annual per capita income of farmers, the poverty types of farmers are divided into the following three categories: absolutely poor type, relatively poor type and non-poor type. Among them, the absolutely poor type refers to the farmers whose annual per capita net income is lower than China’s poverty standard in 2018; the relatively poor type refers to the farmers whose annual per capita net income is within the floating range of the relative poverty line; the non-poor type refers to the
farmers whose annual per capita net income is higher than the floating range of relative poverty line. See Table 2 for specific standards.

Table 2. Standard classification of poverty types of farmers.

| Poverty Type         | Standard                     |
|----------------------|------------------------------|
| Absolutely poor type | <3535 yuan/person-year       |
| relatively poor type | 3535–7380.6 yuan/person-year |
| non-poor type        | >7380.6 yuan/person-year     |

3.2.3. Entropy Method

This research mainly adopts the entropy method of Zeng et al. [37] to weigh the index. The entropy method determines the weight through the combination of mathematics and computing to determine the degree of dispersion of indicators. Entropy is a measure of uncertainty. The greater the amount of information, the smaller the uncertainty, and the smaller the entropy; the smaller the amount of information, the greater the uncertainty, and the greater the entropy. According to the characteristics of entropy, the degree of dispersion of an index can be judged by calculating the entropy value. The greater the degree of dispersion of the entropy value, the greater the influence of the index on the comprehensive evaluation. Therefore, according to the degree of variation of various indicators, the tool of information entropy can be used to calculate the weight of each indicator to provide a basis for comprehensive evaluation of multiple indicators. Compared with the subjective weighting method, the entropy method has higher credibility and accuracy. Based on this, this study uses the entropy method to obtain the weights of the various indicators of livelihood risks faced by farmers and the comprehensive index of the four types of livelihood risks. The principle and calculation steps of the entropy method are detailed in Peng et al. [38] and Xu et al. [88].

The entropy method is used to calculate the weight of each index, and the right column of Table 1 is the calculation result. The most serious livelihood risk faced by farmers was geological disasters (15.2%), followed by extreme weather (11.9%) and shortage of funds (10.7%); the least livelihood risk faced by farmers was soil erosion (2.7%), followed by water shortage (3.0%) and external environment (3.3%).

3.2.4. Analytic Strategy

The dependent variable is the three poverty types (absolutely poor type, relatively poor type and non-poor type) of farmers, which is an order and multi classification variable. This study encodes the absolutely poor type as 1, the relatively poor type as 2 and the non-poor type as 3 according to the net income level from low to high. Based on this, this study uses the ordinal logistic regression to explore the differences of livelihood risks faced by different types of poor farmers.

4. Results

4.1. Descriptive Statistical Analysis

According to Table 1, in terms of the four livelihood risks faced by farmers, the comprehensive score of environmental risk is the highest (0.40), followed by financial risk (0.33), health risk (0.17), and social risk (0.10). Among them, in terms of health risks faced by farmers, about 33% of the farmers suffer from genetic diseases or serious diseases, and about 10% suffer from livestock plague, dysentery or diseases caused by major industrial pollution. About half of the farmers think that the village health care system is perfect. In terms of environmental risks faced by farmers, about 94% of farmers believe that water resources can meet the basic needs of production and life, and the degree of soil erosion is between not serious and normal. Less than half of the farmers have experienced the impact of pests and diseases. But up to 70% of the farmers believe that extreme weather has an impact on production and life, and up to 80% of farmers believe that geological disasters have an impact on production and life. In terms of financial risks faced by farmers,
approximately 16% of farmers have bought counterfeit agricultural products, and more than 20% of farmers made mistakes in business strategy decisions, which caused losses to their families. Approximately 30% of farmers have been affected by the price fluctuations of agricultural products, and more than half of the farmers believe that it is difficult for them to lack funds to expand the scale of agricultural production and obtain bank loans. In terms of social risks faced by farmers, the vast majority of farmers have participated in the village’s public affairs decision-making, but about 38% of farmers believe that they will be worried about their livelihoods due to the lack of basic security. Fewer farmers believe that they have a certain social status in the village.

As far as the poverty type of farmers is concerned (Figure 3), the absolutely poor type is the most common (177 households, accounting for 54.1%), followed by the non-poor type (109 households, accounting for 33.3%), and the relatively poor type is the least common (41 households, accounting for 12.6%).

![Figure 3. Statistics on the frequency of farmers’ poverty types.](image-url)

**4.2. Model Results**

We first used the ordinal logistic regression to explore the correlation between livelihood risks and poverty types. Table 3 shows the ordinal logistic regression results of the difference in livelihood risk impacts of different types of farmers. Secondly, we used the score test for the proportional odds assumption. A significant test statistic provided evidence that the parallel regression assumption has been violated. That means the model did not pass the score test for the proportional odds assumption. Finally, we decided to use the multinomial logistic regression.

Table 4 shows the multinomial logistic regression results of the difference in livelihood risk impacts of different types of farmers. The model takes the relatively poor type as the reference group, and obtains the results corresponding to the other two poverty types. From the statistical results of the chi-square test of the model (LR $\chi^2(8) = 28.05; p < 0.01$), the model passed the overall significance test, indicating that at least one independent variable has a significant correlation with the dependent variable, and subsequent analysis can be performed.
Table 3. Ordinal logistic regression results of the difference in livelihood risks faced by different types of poverty-stricken farmers.

| Types of Poverty |   |   |
|------------------|---|---|
| Health risk      | 3.058 | (1.38) |
| Environmental risk | 1.298 | (1.26) |
| Financial risk   | 1.916 | (1.37) |
| Social risk      | 10.66*** | (3.34) |
| cut1_cons        | 1.801*** | (4.93) |
| cut2_cons        | 2.363*** | (6.33) |
| Wald chi²(4)     | 24.63  |
| Prob > chi²      | 0.0001 |
| Pseudo R²        | 0.0370 |

Note: The model used the “relative poverty type” as the reference group; robust standard errors are in parentheses; *** indicate significance at levels of 0.01, respectively.

The second column in Table 4 is the comparison result of the absolutely poor type and the relatively poor type. Compared with absolutely poor farmers, relatively poor farmers are more seriously impacted by social risk. Specifically, for every increase of 1 unit of the impact of social risks on farmers, the odds of becoming an absolutely poor farmer relative to a relatively poor farmer will decrease by 17.41 units.

The third column in Table 4 is a comparison between the non-poor type and the relatively poor type. There is no significant difference in the impact of the four types of livelihood risks on both the non-poor type farmers and relatively poor type farmers.

According to Table 4, the social risk index is the only significant one, so we used the ordinal logistic regression to explore the impact of public affairs and social security status on different types of farmers. Table 5 shows the ordinal logistic regression results of the impact of public affairs and social security status on different types of farmers. Furthermore, we used the score test for the proportional odds assumption. A significant test statistic provided evidence that the parallel regression assumption has been violated. That means the model did not pass the score test for the proportional odds assumption. Lastly, we decided to use the multinomial logistic regression.
Table 5. Ordinal logistic regression results of impact of public affairs and social security status on different types of farmers.

| Types of Poverty          | Public affairs | Social security status | cut1_cons | cut2_cons | Wald chi² (4) | Prob > chi² | Pseudo R² |
|---------------------------|----------------|------------------------|-----------|-----------|---------------|-------------|----------|
|                           | 28.93 ***       | 5.839                  | 1.407 *** | 1.967 *** |               |             |          |
|                           | (4.19)          | (1.52)                 | (4.58)    | (6.15)    |               |             |          |

Wald chi² (4) = 21.02
Prob > chi² = 0.0000
Pseudo R² = 0.0371

Table 6 shows the multinomial logistic regression results of the impact of public affairs and social security status on different types of farmers. The model takes the relatively poor type as the reference group, and obtains the results corresponding to the other two poverty types. From the statistical results of the chi-square test of the model (LR chi² (4) = 26.72; p < 0.01), the model passed the overall significance test, indicating that at least one independent variable has a significant correlation with the dependent variable, and subsequent analysis can be performed.

Table 6. Multinomial logistic regression results of the impact of public affairs and social security status on different types of farmers.

|                     | Absolutely Poor Type | Non-Poor Type |
|---------------------|----------------------|---------------|
| Public affairs      | −27.88 **            | 2.651         |
|                     | (−2.43)              | (0.21)        |
| Social security     | −13.98 **            | −8.380        |
| status              | (−2.12)              | (−1.22)       |
| Constant            | 2.997 ***            | 1.232 **      |
|                     | (5.41)               | (2.01)        |
| LR chi² (4)         | 26.72                |               |
| Prob > chi²         | 0.0000               |               |
| Pseudo R²           | 0.0426               |               |

Note: The model used the “relative poverty type” as the reference group; robust standard errors are in parentheses; **, and *** indicate significance at levels of 0.05, and 0.01, respectively.

The second column in Table 6 is the comparison result of the absolutely poor type and the relatively poor type. Compared with absolutely poor farmers, relatively poor farmers are more seriously impacted by public affairs and social security status, and relatively poor farmers are more impacted by public affairs. Specifically, for every increase of 1 unit of the impact of public affairs on farmers, the odds of becoming an absolutely poor farmer relative to a relatively poor farmer will decrease by 27.88 units; for every increase of 1 unit of the impact of social security status on farmers, the odds of becoming an absolutely poor farmer relative to a relatively poor farmer will decrease by 13.98 units.

The third column in Table 6 is a comparison between the non-poor type and the relatively poor type. There was no significant difference in the impact of public affairs and social security status on both the non-poor type farmers and relatively poor type farmers.

5. Discussion

Based on the above theory and policy background, this study used the 2018 survey data of 327 farmers in four districts and counties in the hardest-hit areas of the Wenchuan Earthquake and Lushan Earthquake in China’s Sichuan Province. We systematically analyzed the four types of livelihood risks faced by farmers and the three types of poverty
they were in, and constructed a multinomial logistic regression to explore the correlation between livelihood risks and poverty types. This study was the first to compare the relatively poor type with other poverty types. This research divided poverty types into absolutely poor, relatively poor and non-poor, and compared the livelihood risks faced by the three poverty types. In the existing literature, there are few empirical studies on the comparison between the relatively poor type and other poverty types. The second innovation of this study was to use the entropy method and multinomial logistic regression. This study uses the entropy method, which is more objective than the study of using qualitative methods to obtain index weights and comprehensive indexes. At the same time, we used a multinomial logistic regression to explore the relationship between the four types of livelihood risks and the three poverty types. This study can provide inspiration for similar studies in the future. At the same time, it also has shortcomings. When constructing the livelihood risk measurement analysis model, we did not consider the endogenous problem of variable selection.

This study found that the impacts of the health risks of the three different types of poverty-stricken households are not significant. This is inconsistent with the research Hypothesis H1 and the results of Chen [49] and Quinn et al. [52]. The research Hypothesis H1 assumes that there are significant differences in the impact of health risks on different types of poverty-stricken farmers, and that poor farmers are more impacted by health risks. Chen [49] found that poor farmers will lose the ability to work due to illness, which will cause a catastrophic impact on family income. Quinn et al. [52] found that poor farmers do not have the ability to resist risks and are more impacted by health risks. The possible reason is that the Chinese government has been promoting the full coverage of the “New Rural Cooperative Medical System”, improving the drug policy and integrating the resources of regional medical institutions, striving to solve the problem of “difficult and expensive medical treatment”, and reducing the impact of farmers’ health risks from the root cause.

This study found that the environmental risks faced by farmers with three different poverty types are not significantly different. This is inconsistent with the research Hypothesis H2 and the results of Huiling [66] and Shameem et al. [68]. The research Hypothesis H2 assumes that there are significant differences in the impacts of environmental risks on different types of poverty-stricken farmers, and that poor farmers are more affected by environmental risks. Huiling [66] found that poor farmers are often the first to bear the brunt of natural disasters. Shameem et al. [68] found that poor farmers are more vulnerable to environmental risks and suffer more from food and water safety risks. The possible reason is that the research objects of this study are farmers in the hardest-hit areas of the Wenchuan Earthquake and Lushan Earthquake. Farmers in this area are all facing the threat of earthquake disasters regardless of the poverty types. Therefore, there is no significant difference in the threats faced by farmers of different poverty types.

This study found that the financial risks faced by farmers with three different poverty types are not significantly different. This is inconsistent with the research Hypothesis H3 and the results of Li et al. [74] and Lucas and Pabuayon [78]. The research Hypothesis H3 assumes that there are significant differences in the impact of financial risks on different types of poverty-stricken farmers, and that poor farmers are more impacted by financial risks. Li et al. [74] found that the impact of financial risks will make the per capita net income of poor rural households change larger than that of non-poor rural households. Lucas and Pabuayon [78] found that poor farmers suffer less impact from financial risks. The possible reason is that nowadays farmers mainly rely on non-agricultural income. Farmers are less affected by financial risks such as price fluctuation of agricultural products and lack of funds to expand agricultural production. Therefore, the impact of financial risks on different types of farmers is not significant.

Consistent with the study of Moav and Neeman [72], this study found that, compared with the absolutely poor farmers, the impact of social risk on the relatively poor farmers is more serious, but there is no significant difference between the non-poor farmers and the
relatively poor farmers. This is inconsistent with the research Hypothesis H4 and the results of Kasie et al. [82]. The research Hypothesis H4 assumes that there are significant differences in the impact of different types of poor farmers on social risks, and that poor farmers are more impacted by social risks. Kasie et al. [82] found that farmers with higher income have more social resources, better social relations, and are less impacted by social risks. The possible reason is that poor farmers are poor in human capital, physical capital, financial capital, and natural capital, but they will invest a lot of energy in social participation in order to improve other capital conditions through the increase of social capital.

6. Conclusions

Through the above analysis, we mainly drew the following three conclusions:

(1) Among the four types of livelihood risk, the environmental risk had the highest comprehensive score (0.40), followed by financial risk (0.33), health risk (0.17), and social risk (0.10).

(2) Among the three types of poverty in which farmers live, absolutely poor farmers have the largest number (177 households, accounting for 54.1%), and relatively poor farmers have the least number (41 households, accounting for 12.6%).

(3) Farmers of different poverty types are impacted by different levels of livelihood risks. Specifically, compared with absolutely poor farmers, relatively poor farmers are more severely impacted by social risks, but the impact of health risks, environmental risks and financial risks is not significant. Impacted by social risks, relatively poor farmers are more seriously impacted by public affairs and social security status, especially public affairs. Compared with the non-poor farmers, the relatively poor farmers are not affected by the four livelihood risks.

With the acceleration of China’s integration into the global economy, agricultural production and operations have begun to bear the dual impact of international and domestic markets, and the problem of agricultural structure has become more prominent. Natural risks and other risks act on farmers together, putting different types of poor farmers at livelihood risks. This study was aimed at farmers in areas where earthquake disaster threats and poverty are intertwined, and explored the differences in the impact of livelihood risks among absolutely poor farmers, relatively poor farmers, and non-poor farmers. It can provide theoretical support for different types of poor farmers to improve their ability to withstand risks, promote the stability of the agricultural economic structure, guarantee the income of farmers, and promote rural development. At the same time, 2020 is the final year of China’s poverty alleviation. After 2020, the focus of China’s poverty alleviation work will shift from solving absolute poverty to alleviating relative poverty. This research can bring some useful enlightenments to the formulation and implementation of government policies, as follows:

(1) The government should consolidate the continued stability of agricultural and rural financial investment to prevent non-poor households from falling into poverty due to financial risks. The research results show that non-poor farmers are more severely impacted by financial risks. The government should increase the intensity and capital investment of welfare policies such as critical illness relief, industrial poverty alleviation, and public welfare posts, and help non-poor farmers to build a strong livelihood capital base and improve their livelihood capabilities through “blood-making” methods.

(2) The government should expand the social resources of farmers through poverty alleviation projects. The research results show that non-poor farmers are more severely impacted by social risks. The government should provide farmers with more market information, market sales channels, and financial and physical capital support, and encourage non-poor farmers to learn to independently develop markets and establish social resources.

Finally, there are suggestions for further research:
Future research needs to design a more comprehensive indicator system to measure the difference in livelihood risk between different types of poverty-stricken households. It is necessary to consider the endogenous problem of variable selection, and at the same time pay more attention to the impact of various livelihood risk variables on the farmers’ economy, select the economic benefits of different types of poor farmers as the evaluation object, and make a reasonable efficiency evaluation.

The impact of different types of poverty-stricken households on industries and the economy is comprehensive and complex, and it is necessary to conduct in-depth research on them from the perspective of more participants. Participants not only involve farmers of different types of poverty, but also governments, enterprises and various intermediary organizations, so they need to be fully considered in future research.

Author Contributions: Conceptualization, X.Z. and Z.F.; methodology, X.Z. and Z.F.; software, X.Z.; validation, X.Z. and Z.F.; formal analysis, X.Z.; investigation, D.X. and X.D.; resources, D.X.; data curation, X.Z.; writing—original draft preparation, X.Z., Z.F., D.X. and X.D.; writing—review and editing, D.X. and X.D.; visualization, D.X. and X.D.; supervision, D.X.; project administration, D.X. and X.D.; funding acquisition, D.X. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by National Natural Science Foundation of China (41801221), Special Program for Cultivating Excellent Young Talents under the Dual Support Plan of Sichuan Agricultural University, Undergraduate research interest cultivation program in 2021 of Sichuan agricultural university (2021489; 2021488).

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Acknowledgments: We gratefully acknowledge financial support from National Natural Science Foundation of China (41801221), Special Program for Cultivating Excellent Young Talents under the Dual Support Plan of Sichuan Agricultural University, Undergraduate research interest cultivation program in 2021 of Sichuan agricultural university (2021489; 2021488). The authors also extend great gratitude to the anonymous reviewers and editors for their helpful review and critical comments.

Conflicts of Interest: The authors declare that they have no conflict of interest. This article does not contain any studies with human participants or animals performed by any of the authors. Informed consent was obtained from all individual participants included in the study.

References
1. Wang, W. Research on the Multidimensional Poverty Dynamics of Rural Households. Ph.D. Thesis, Zhongnan University of Economics and Law, Wuhan, China, 2018.
2. United Nations. Transforming our World: The 2030 Agenda for Sustainable Development; United Nations: New York, NY, USA, 2015.
3. United Nations. Millennium Development Goals Report 2015; United Nations: New York, NY, USA, 2015.
4. United Nations. Global Multidimensional Poverty Index 2019; United Nations: New York, NY, USA, 2019.
5. Xu, H.L. Research on Sustainable Livelihoods of Relatively Poor Families in Rural Areas of Southwest Zhejiang. Master’s Thesis, Zhejiang Agriculture and Forestry University, Zhejiang, China, 2016.
6. United Nations. Financing for Sustainable Development Report 2021; United Nations: New York, NY, USA, 2021.
7. Fritzell, J.; Rehnberg, J.; Bacchus Hertzman, J.; Blomgren, J. Absolute or relative? A comparative analysis of the relationship between poverty and mortality. Int. J. Public Health 2014, 60, 101–110. [CrossRef] [PubMed]
8. Reutlinger, S. Malnutrition: A poverty or a food problem? World Dev. 1997, 5, 715–724. [CrossRef]
9. Schvittay, A.F. Making poverty into a financial problem: From global poverty lines to KIVA.ORG. J. Int. Dev. 2013, 26, 508–519. [CrossRef]
10. Turner, G. The credit crunch: Housing bubbles, globalisation and the worldwide economic crisis. Sov. Phys. Dokl. 2009, 17, 317–319.
11. Piccato, P.; Fische, B. A Poverty of Rights: Citizenship and Inequality in Twentieth-Century Rio de Janeiro; University Press: Stanford, CA, USA, 2008; Volume 115, pp. 591–592. [CrossRef]
12. Song, G.W. Study on the Harm of Poverty. Gansu Agric. 2016, 1, 20–21.
13. Bartels, L.M. Unequal democracy: The political economy of the new gilded age. Econ. Books 2016, 73, 226–229. [CrossRef]
14. Wilkinson, R.G.; Pickett, K. The Spirit Level: Why Equality Is Better for Everyone; Penguin book: London, UK, 2010.
15. Conradt, E.; Measelle, J.; Ablow, J.C. Poverty, problem behavior, and promise. Psychol. Sci. 2013, 24, 235–242. [CrossRef] [PubMed]
16. Klebanov, P.K.; Brooks-Gunn, J.; Duncan, G.J. Does neighborhood and family poverty affect mothers’ parenting, mental health, and social support? J. Marriage Fam. 1994, 56, 441. [CrossRef]
17. Leventhal, T.; Brooks-Gunn, J. The neighborhoods they live in: The effects of neighborhood residence on child and adolescent outcomes. Psychol. Bull. 2000, 126, 309–337. [CrossRef]
18. Xu, D.; Feng, L.; Liu, S.; Su, C.; Wang, X.; Chen, T. Influences of migrant work income on the poverty vulnerability disaster threatened area: A case study of the Three Gorges Reservoir area, China. Int. J. Disast. Risk Reduct. 2017, 22, 62–70. [CrossRef]
19. Ravallion, M.; Chen, S. Weakly relative poverty. Rev. Econ. Stat. 2011, 93, 1251–1261. [CrossRef]
20. Riungu, G.K. Book review: Holden, Andrew. 2013: Tourism, Poverty and Development. Prog. Dev. Stud. 2015, 15, 393–395. [CrossRef]
21. Sun, J.W.; Xia, T. China’s Poverty Alleviation Strategy and the Delineation of Relative Poverty Line after 2020—Analysis Based on Theory, Policy and Data. China Rural Econ. 2019, 10, 98–113.
22. Zheng, B. Statistical inference for poverty measures with relative poverty lines. J. Econom. 2001, 101, 337–356. [CrossRef]
23. Zhou, Y.X.; Ye, J.Y. The role of social capital in alleviating rural poverty: Literature review and research prospects. South. Econ. 2014, 7, 35–57.
24. Wang, S.G.; Liu, M.Y. From Absolute Poverty to Relative Poverty: Theoretical Relationship, Strategic Transformation and Policy Focus. J. South China Norm. Univ. (Soc. Sci. Ed.) 2020, 2020, 18–29.
25. World Bank. World Development Report 1990; World Bank: Washington, DC, USA, 1990.
26. Townsend, P. Introduction: Concepts of Poverty and Deprivation. J. Soc. Policy 1979, 15, 499–501. [CrossRef]
27. Alvarez, S.A.; Barney, J.B.; Newman, A.M.B. The poverty problem and the industrialization solution. Asia Pac. J. Manag. 2015, 32, 23–37. [CrossRef]
28. Xu, D.; Deng, X.; Guo, S.; Liu, S. Sensitivity of livelihood strategy to livelihood capital: An empirical investigation using nationally representative survey data from rural China. Soc. Indic. Res. 2019, 144, 113–131. [CrossRef]
29. Kong, H.L.; Wu, J. Research on farmers’ livelihood risks: A case study of Le’an county, Jiangxi. J. Guangxi Univ. Natl. (Philos. Soc. Sci. Ed.) 2007, 2007, 55–59.
30. Su, F. Analysis of the impact of farmers’ livelihood risks on their livelihood capital—Taking Shiyang River Basin as an example. Agric. Technol. Econ. 2017, 2017, 87–97.
31. Addison, J.; Brown, C. A multi-scaled analysis of the effect of climate, commodity prices and risk on the livelihoods of Mongolian pastoralists. J. Arid Environ. 2014, 109, 54–64. [CrossRef]
32. Papa, C.; Nzoikou, P.; Mbow, C. Farmer Livelihood Strategies and Attitudes in Response to Climate Change in Agroforestry Systems in Kedougou, Senegal. Environ. Manag. 2020, 66. [CrossRef]
33. Scoones, I.; Wolmer, W. Introduction: Livelihoods in crisis: Challenges for rural development in South Africa. IDS Bull. 2003, 34, 1–14. [CrossRef]
34. Su, F.; Shang, H.Y. The impact of farmers’ livelihood capital in crisis on their risk response strategies: A case study of Zhangye City in the Heihe River Basin. China Rural Econ. 2012, 2012, 79–87.
35. Chen, S.G.; Su, S.P. The livelihood risks and coping strategies of farmers under the impact of a major epidemic—A case study based on mountainous areas in Fujian. J. Fujian Agric. For. Univ. (Philos. Soc. Sci. Ed.) 2020, 23, 1–6.
36. Xu, D.; Zhou, W.; Deng, X.; Ma, Z.; Yong, Z.; Qing, C. Information credibility, disaster risk perception and evacuation willingness of rural households in China. Nat. Hazards 2020, 103, 2865–2882. [CrossRef]
37. Zeng, X.Y.; Guo, S.L.; Deng, X.; Xu, D.D. Livelihood risk and adaptation strategies of farmers in earthquake hazard threatened areas: Evidence from sichuan province, China. Int. J. Disaster Risk Reduct. 2021, 53, 101971. [CrossRef]
38. Peng, L.; Xu, D.D.; Wang, X.X. Vulnerability of rural household to climate variability and adaptive strategies in landslide-threatened western mountainous regions of the Three Gorges Reservoir Area, China. Clim. Dev. 2019, 11, 469–484. [CrossRef]
39. Wang, X.L.; Feng, H.X. China’s multidimensional relative poverty standards after 2020: International experience and policy orientation. China’s Rural Econ. 2020, 2020, 2020, 2–21.
40. Gui, H. Relative poverty and anti-poverty policy system. People’s Forum 2019, 2019, 60–61.
41. Alam, S.M.S. Sustainable Tourism Development & Poverty Alleviation; Lambert Academic Publishing: Saarbrücken, Germany, 2017.
42. Knight, J.; Shi, L. Three Poverties in Urban China. Rev. Dev. Econ. 2006, 10, 367–387. [CrossRef]
43. Liu, W.; Li, J.; Li, C.; Li, S.Z. Analysis of poverty types and influencing factors of immigrant relocated farmers—Sampling survey based on Ankang in southern Shaanxi. J. Zhongnan Univ. Econ. Law 2015, 6, 41–48.
44. Sarwors; Sunaryono, D.; Akbar, R.J.; Setyawawan, R.D. Poverty classification using Analytic Hierarchy Process and k-means clustering. In Proceedings of the 2016 International Conference on Information & Communication Technology and Systems (ICTS), Surabaya, Indonesia, 12–12 October 2016. [CrossRef]
45. Su, F.; Song, N.N.; Ma, J.; Luo, W.C. Risk response strategies of different capital-deficient farmers—Taking the Qinba Mountains in southern Shaanxi as an example. J. China Agric. Univ. 2020, 25, 215–226.
46. Sarker, M.; Wu, M.; Alam, G.; Shouse, R.C. Life in riverine islands in bangladesh: Local adaptation strategies of climate vulnerable riverine island dwellers for livelihood resilience. Land Use Policy 2020, 94, 104574. [CrossRef]
47. Jin, J.J.; Tong, X.H.; Wan, X.Y.; He, R.; Kuang, F.; Ning, J. Farmers’ risk aversion, loss aversion and climate change adaptation strategies in Wushen Banner, China. J. Environ. Plan. Manag. 2020, 2020, 1–14. [CrossRef]
48. Nguyen, A.T.; Nguyen, L.T.; Nguyen, H.H.; Van Ta, H.; Van Nguyen, H.; Pham, T.A.; Nguyen, B.T.; Pham, T.T.; Tang, N.T.T.; Hens, I. Rural livelihood diversification of Dzao farmers in response to unpredictable risks associated with agriculture in Vietnamese Northern Mountains today. *Environ. Dev. Sustain.* 2019, 1, 5387–5407. [CrossRef]

49. Chen, C.B. Risk and vulnerability of farmers: An analytical framework and the experience of poor areas. *Agric. Econ. Issues* 2005, 2005, 47–50.

50. Zhao, X.Y.; Zhao, H.L.; Liu, C.F. The livelihood risks and coping strategies of farmers in the lower reaches of Shiyang River—Taking Minqin Oasis as an example. *Geogr. Res.* 2015, 34, 922–932.

51. Dercons. *Assessing Vulnerability*; Publication of the Jesus College and CSAE: Oxford, UK, 2001; Volume 2, pp. 1–79.

52. Quinn, C.H.; Huby, M.; Kiwaisila, H.; Lovett, J.C. Local perceptions of risk to livelihood in semi-arid Tanzania. *J. Environ. Manag.* 2003, 68, 111–119. [CrossRef]

53. Su, F.; Saikia, U.; Hay, I. Impact of perceived livelihood risk on livelihood strategies: A case study in Shiyang River Basin, China. *Sustainability* 2019, 11, 3349. [CrossRef]

54. Ye, P.W. A review of researches on the concept and types of poverty. *J. Econ.* 2006, 2006, 67–69.

55. Chi, Z.H.; Yang, Y.Y. Summary of Research on Poverty Line. *Econ. Theory Econ. Manag.* 2012, 2012, 56–64.

56. Lund, M.S.; Townsend, P. Poverty in the United Kingdom: A Survey of Household Resources and Standards of Living. By Townsend Peter. (Berkeley: University of California Press, 1979. Pp. 1216. $37.50, cloth; $15.95, paper.). *Am. Political Sci. Assoc.*

57. Liu, X. Application of the Martin method in the study of rural poverty standards in China. *J. Shenyang Univ.* 1996, 4, 28–30.

58. World Bank. *World Development Report 2000/2001 Attacking Poverty*; World Bank: Washington, DC, USA, 2000.

59. Su, F.; Saikia, U.; Hay, I. Relationships between livelihood risks and livelihood capitals: A case study in Shiyang River Basin, China. *Sustainability* 2018, 10, 509. [CrossRef]

60. Tao, Y.; Gai, Z.Y. Review and prospect of research on economic behavior of poor farmers under the impact of health risks. *Int. J. Infect. Dis.* 2020, 41, 135–142.

61. Hu, H.W.; Liu, Y.L.; Zhang, Y.R. Medical insurance, poverty and family medical consumption—based on panel fixed effects Tobit Model estimation. *J. Shanxi Univ. Financ. Econ.* 2012, 34, 1–9.

62. Ellis, F. Household strategies and rural livelihood diversification. *J. Dev. Stud.* 1998, 35, 1–38. [CrossRef]

63. Cheng, X.; Shuai, C.M.; Wang, J.; Li, W.J.; Liu, Y. Review of research on the impact of ecological environment and disasters on poverty. *Resour. Sci.* 2018, 40, 676–697.

64. Li, M. Research on the risk sharing mechanism in the process of agricultural scale operation. *Rural Econ. Technol.* 2019, 30, 109.

65. Tsegaye, D.; Vedeld, P.; Moe, S.R. Pastoralists and livelihoods: A case study from northern Afar, Ethiopia. *Land Use Policy* 2012, 676–697.

66. Huling, L.I.; Haixia, M.A.; Yang, R. Influence of cotton farmer’s livelihood capitals on livelihood strategy—Based on the survey data of Manas and Awat counties, Xinjiang. *J. Arid Land Resour. Environ.* 2017, 31, 57–63.

67. Yang, J.; Yang, Y.; Cao, Y.; Wang, B. An empirical study on the willingness of poverty alleviation and relocation of poor households in Luliang Mountain Area—Taking Shencheng County and Wuzhai County as examples. *Shanxi Agric. Econ.* 2019, 2019, 63–64.

68. Shameem, M.M.; Mamtaz, S.; Rauscher, R. Vulnerability of rural livelihoods to multiple stressors: A case study from the southwest coastal region of Bangladesh. *Ocean Coast. Manag.* 2014, 102, 79–87. [CrossRef]

69. Peria, A.S.; Pulhin, J.M.; Tapia, M.A.; Peria, A.; Predo, C., Jr.; Peras, R.J.; Evangelista, R.J.; Lasco, R.; Pulhin, F. Knowledge, risk attitudes and perceptions on extreme weather events of smallholder farmers in ligao city, albay, bicol, philippines. *J. Environ. Sci. Manag.* 2016, 2016, 31–41.

70. Luo, Y.; He, J.; Liu, Q.X. The status quo of rural human settlements in poverty-stricken areas of Yunnan and suggestions for improvement. *Guide J. Environ. Sci.* 2020, 39, 1–3.

71. Chen, Y.D. Research on the Dynamic Relationship between the Price Fluctuation of Agricultural Products in My Country and the Increase of Farmers’ Income. Master’s Thesis, Qingdao University, Qingdao, China, 2019.

72. Moav, O.; Neeman, Z. Saving Rates and Poverty: The Role of Conspicuous Consumption and Human Capital. *Econ. J.* 2012, 122, 933–956. [CrossRef]

73. Longpichai, O.; Perret, S.R.; Shivakoti, G.P. Role of Livelihood Capital in Shaping the Farming Strategies and Outcomes of Smallholder Rubber Producers in Southern Thailand. *Outlook Agric.* 2012, 41, 117–124. [CrossRef]

74. Li, W.; Li, X.P.; Wang, S.G. The impact of agricultural product price changes on the income of farmers in poor areas. *China Rural Econ.* 2003, 2003, 18–21.

75. Gao, Y.B.; Yan, Y.P. Research on the Obstacles and Countermeasures of Farmers’ Participation in Agricultural Products Futures Market in Henan Province. *Farm Econ. Manag.* 2020, 2020, 8–10. [CrossRef]

76. Feder, G.; Nishio, A. The benefits of land registration and titling: Economic and social perspectives. *Land Use Policy* 1998, 15, 25–43. [CrossRef]

77. Jiao, X.; Pouliot, M.; Waleiglin, S.Z. Livelihood Strategies and Dynamics in Rural Cambodia. *World Dev.* 2017, 97, 266–278. [CrossRef]

78. Lucas, M.P.; Pabuayon, I.M. Risk perceptions, attitudes, and influential factors of rainfed lowland rice farmers in Ilocos Norte, Philippines. *Asian J. Agric. Dev.* 2011, 08, 61–77.
79. Yang, Y.X. Governance of Farmers’ Response to Rural Social Risks—Based on the Analysis Perspective of Feasible Ability. 
   *J. Sichuan Univ. Sci. Technol. (Soc. Sci. Ed.)* **2013**, *28*, 17–21.
80. Colchester, M.; Lohmann, L. *The Struggle for Land and the Fate of the Forests*; World Rainforest Movement: Penang, Malaysia, 1993.
81. Dale, A.; Newman, L. Social capital: A necessary and sufficient condition for sustainable community development? *Community Dev. J.* **2008**, *45*, 5–21. [CrossRef]
82. Kasie, T.; Agrandio, A.; Adgo, E.; Garcia, I. Household Resilience to Food Insecurity: Shock Exposure, Livelihood Strategies and Risk Response Options: The case of Tach-Gayint District 2017, Amhara Region, Ethiopia. Ph.D. Thesis, University of Jaume I, Castelló, Spain, 2017.
83. Zhou, W.F.; Ma, Z.X.; Guo, S.L.; Deng, X.; Xu, D.D. Livelihood capital, evacuation and relocation willingness of residents in earthquake-stricken areas of rural China. *Safety Sci.* **2021**, *141*, 105350. [CrossRef]
84. Zhou, W.F.; Guo, S.L.; Deng, X.; Xu, D.D. Livelihood resilience and strategies of rural residents of earthquake-threatened areas in Sichuan Province, China. *Nat. Hazards* **2021**, *106*, 255–275. [CrossRef]
85. Ma, Z.X.; Guo, S.L.; Deng, X.; Xu, D.D. Community resilience and resident’s disaster preparedness: Evidence from China’s earthquake-stricken areas. *Nat. Hazards* **2021**, *108*, 567–591. [CrossRef]
86. Qing, C.; Guo, S.L.; Deng, X.; Xu, D.D. Farmers’ Disaster Preparedness and Quality of Life in Earthquake-prone Areas: The Mediating Role of Risk Perception. *Int. J. Disaster Risk Reduct.* **2021**, *59*, 102525. [CrossRef]
87. Zhuang, L.M.; He, J.; Yong, Z.L.; Deng, X.; Xu, D.D. Disaster information acquisition by residents of China’s earthquake-stricken areas. *Int. J. Disaster Risk Reduct.* **2020**, *51*, 101908. [CrossRef]
88. Xu, D.D.; Liu, E.L.; Wang, X.X.; Tang, H.; Liu, S.Q. Rural households’ livelihood capital, risk perception, and willingness to purchase earthquake disaster insurance: Evidence from southwestern China. *Int. J. Environ. Res. Public Health* **2018**, *15*, 1319. [CrossRef] [PubMed]