Article

What Affects the Livelihood Risk Coping Preferences of Smallholder Farmers? A Case Study from the Eastern Margin of the Qinghai-Tibet Plateau, China

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Abstract: As the smallest livelihood unit in rural areas, farmers often face multiple risks. Rational responses to livelihood risks not only prevent households from falling into poverty, but also improve the sustainability of family livelihoods. This is essential to the sustainable development of rural areas. This paper takes the region located in the eastern margin of the Qinghai-Tibet Plateau in China as an example, using household survey data to analyze farmers’ livelihood risk coping strategies and their key factors through a binary logistic model. The results show that 92.80% of farmers face the shock of multiple livelihood risks. The main livelihood risks of farmers are family capacity building risk, health risk and social risk. When faced with multiple livelihood risks, farmers have the strongest preference to give priority to health risks, followed by family capacity building risks and social risks. Among them, farmers’ health risk coping preferences are stronger in farming areas than those in purely pastoral and farming-pastoral areas. There are differences in the factors for farmers’ preferences for coping with different livelihood risks. Human capital is a key factor for health risk coping preferences. Human capital and social capital are key factors for social risk coping preferences. Social capital is a key factor for family capacity building risk coping preferences. Finally, this paper puts forward countermeasures and suggestions to provide reference for farmers rationally coping with livelihood risks.

Keywords: livelihood risk; livelihood risk perception; risk preferences; livelihood capital; the Qinghai-Tibet Plateau

1. Introduction

Since the beginning of the 21st century, under the dual effects of human activities and climate change, the natural environment has been deteriorating, and natural disasters have frequently occurred. In addition, because of the current COVID-19 pandemic sweeping the world, people’s survival pressures have increased. This makes the sustainable development of human society face severe challenges [1–3]. The Global Risk Report 2020 points out that the world’s top five risks are all related to environment. Climate change is more severe and rapid than many people expected. At the same time, natural disasters have become more serious and frequent, leading to unprecedented extreme weather around the world. This has brought serious negative impacts upon the world, and lowered people’s living standards. The “2030 Agenda for Sustainable Development” proposes to enhance the resilience of the poor and those vulnerable to disasters, and reduce their probability of being exposed to extreme weather events and other economic, social and environmental shocks and disasters. Farmers are more vulnerable to natural, health, financial and policy risks in many developing countries or marginal areas. The interaction of various risks forms multi-level, complex feedback and nested relationships. This not only amplifies the harmfulness of various risks, but also enhances the convertibility between different risks.
This exacerbates the livelihood vulnerability of farm households [4,5]. When farmers face multiple livelihood risk shocks, they tend to allocate limited assets, based on risk coping preferences, to mitigate the negative impacts of livelihood risks. Hence, livelihood risk coping preferences play an important role in farmers’ livelihood activities [6].

Much of the existing literature on this topic has focused on the livelihood risk, livelihood vulnerability, livelihood resilience, etc. Among them, livelihood risk research includes definition, division, relationships between livelihood risk and livelihood capitals, influence of perceived livelihood risk on livelihood strategies, and livelihood risk perception [5,7–9]. Livelihood resilience research includes concept, measurement framework, relationships between livelihood assets and livelihood resilience, and internal correlation between natural disasters and livelihood resilience [10,11]. Livelihood vulnerability research includes concept, assessment method, and analytical framework [12,13]. Only a few studies have attempted to analyze relationships between livelihood risk preference and livelihood capitals (livelihood risk perception). Risk preference is an important research topic, especially in the study of farm household productive livelihoods. It is the type of risk that decision makers are willing to take in pursuit of value when faced with risk [14]. The risk preferences and risk perception processes of decision makers are essential to promote sustainable farm household livelihoods. Risk appetite mainly involves psychology, sociology, economics, and geography. The research mainly includes risk perception and preference [15], risk and coping strategies [16], preference and adaptation strategy relationships [17], risk preference and influencing factors [18], the relationship between risk preferences and certification decisions [19], differences between subjective and objective risk preferences [20], preference reversals [21], the influence of risk preferences on energy use behavior [22], heterogeneity in preferences [23], etc. Existing studies have pointed out that gender [18,24,25], age [18,26] (Nielsen et al., 2013; Tanaka et al., 2010), family size [27], education level [18,28,29], etc. will affect individual risk preferences. In addition, social capital, such as kinship and other social networks, as well as village leadership, are also important factors for risk preferences. Moreover, individual risk perception has significant effects on risk coping preferences [30] (Botzen et al., 2009). Tam et al. concluded that adaptation policy preference was significantly and negatively related to risk perception in each case [15]. Grisleya et al. reported that the price of rice and farmers’ age were not related to farmers’ risk preference [31]. Nielsen et al. found that gender, education level, and social networks were important factors for risk preferences [18]. Frey R et al. suggested that gender and age had robust and consistent associations with risk preference [32]. Jin et al. showed that women farmers are more reluctant to adopt new technologies than men on strategies concerning risk preference and climate change adaptation [17]. Torres et al. argued that farmers’ preferences for mitigation and adaptation actions are closely related to their crop types [33]. Cullen et al. attempted to understand whether, and how, men’s and women’s risk preferences were different [34]. On the whole, current research on risk preference mainly includes the impact of risk preferences and single factors on risk preferences. Less academic attention has been paid to the factors influencing preferences for coping with different livelihood risk types. Farmers often face multiple risks such as natural disasters, health, and economic risks. They tend to prioritize certain types of livelihood risks to maximize their benefits. China has achieved comprehensive poverty alleviation. However, due to frequent natural disasters, strong constraints on water and soil resources, and poor location conditions [35], farmers in these areas are still facing multiple risk shocks. There is a risk of returning to poverty. In particular, the eastern margin of the Qinghai-Tibet Plateau used to be one of the “three districts and three states” with deep poverty. It will face stronger shocks from multiple risks and a higher risk of returning to poverty. From the perspective of farmers’ preferences, this study focuses on the role of livelihood risk perceptions and livelihood capital in the choice of coping types of risks faced by farmers. We aimed to find out how livelihood risk perception and livelihood capitals affect farmer livelihood risk coping preferences. This provides a reference to formulate and implement effective livelihood risk coping strategies for communities with multiple livelihood risks in
developing countries. In addition, it provides important practical evidence for the study of livelihood risk perceptions and livelihood capitals in the risk coping process of policy makers. Determining the livelihood risk coping preferences of farm households is essential to effectively cope with livelihood risks, prevent farmers from returning to poverty, and improve livelihood sustainability. In view of this, this paper takes the eastern edge of the Qinghai-Tibet Plateau in China as an example to analyze the livelihood risk coping preferences of farmers in the area and explore the key factors that affect the livelihood risk preferences of farmers. It aims to provide policy recommendations for formulating livelihood risk coping strategies. The structure of the article is as follows: the next section is Materials and Methods; followed by Results and Discussion; the last part is the Conclusion.

2. Materials and Methods
2.1. Study Area

The eastern margin of the Tibetan Plateau in China is the transition zone between the Qinghai-Tibet Plateau and the Loess Plateau. The total area is about 45,000 km² [36], and most of the area is at an altitude of 3000–3600 m. The climate is cold and humid, and the average annual temperature is below 3 °C. It is a typical highland continental climate. The farmers in this special geographical environment are more susceptible to respiratory diseases than the farmers in the plains [37]. This area is not only the national key ecological function area, but also one of the main pastoral areas in China. In addition, water resources are abundant and the water system is developed. The average annual supply of water from this area to the Yellow River is 6.6 billion m³, accounting for 11.4% of the total flow of the Yellow River. It is an important water source reserve for the “Chinese Water Tower” on the Qinghai-Tibet Plateau, and the most important water supply area for the upper reaches of the Yellow River. However, due to the combined effects of natural and human socio-economic activities and the impact of global climate change, grassland drought and desertification in this area have increased, precipitation has decreased, and rodent incidents have occurred frequently. In addition, the source area of the river causes farmers to face environmental and ecological policy issues in the area [38]. Compared with the early 1980s, the area of degraded grasslands in the eastern margin of the Tibetan Plateau has increased nearly 120-fold. Severely degraded grasslands accounted for more than 30% of the degraded grassland area, soil erosion increased by 47.57% and wetland area decreased by 67.68% [39]. In addition, the district is also one of the “three districts and three states” deep poverty areas. It is a multi-ethnic settlement dominated by Tibetans. At the end of 2019, the per capita disposable income of rural residents was only CNY 8437. This was 87.62% of the average income of Gansu Province, and 52.66% of the national average income, respectively.

According to the geographical environment, resource endowments and farming production conditions, the eastern margin of the Qinghai-Tibet Plateau is divided into purely pastoral areas (PPA), farming-pastoral areas (FPA) and farming areas (FA) [37]. Among them, Luqu, Maqu, and Xiahe are purely pastoral areas, Zhuoni and Diebu are farming-pastoral areas, and Zhouqu and Lintan are farming areas [39] (Figure 1). Farmers are mainly engaged by animal husbandry in purely pastoral areas. The per capita pastoral area is 0.854 ha and the per capita income is CNY 13,612. The income from animal husbandry accounts for 50.23% of the total income. In recent years, the development of Chinese herbal medicine and tourism has also increased the income of farmers. The main livelihoods of farming households in farming-pastoral areas are planting crops (such as barleys, beans, potatoes, grains, vegetables, etc.) and animal husbandry (raising cattle, sheep, horses, etc.). The per capita arable land area of this district is 0.096 ha/person, and the per capita grassland area is 0.10 ha/person. The income from plantation, animal husbandry, wages, and migrant workers accounted for 12.27%, 9.6%, 11.20%, and 16.69% of total income, respectively. Farming households in the farming area are mainly engaged in agriculture and related activities, and the arable land per capita is only 1.3 mu/person. This has caused many household laborers to leave their home for work or business. These classifications
illustrate the geographic variation and socio-economic stratification of the farming sector in the research area, and provide perspectives for livelihood risk analysis.

![Location of the study area.](image)

**Figure 1.** Location of the study area.

With improvement in education levels, the scope of family livelihood diversification expands [40]. According to the education levels of the interviewed households, the farmers are divided into low education level farmers, middle education level farmers, and high education level farmers [41].

### 2.2. Data Sources

The methods of collecting data mainly include field visits and discussions, observations, and questionnaire surveys. In October 2017, we conducted a preliminary survey of farmers in the eastern margin of the Qinghai-Tibet Plateau in China. First, we collected the social, environmental, and economic statistics of each county. To understand the overall situation of each village better, we selected and interviewed members of the village committee from different geographical areas (purely pastoral, farming-pastoral, farming) through random sampling. Then, we used the snowball method to expand our interview; in particular, members of the village committee recommended a family to interview, and then the interviewed family recommended other similar or completely different families for interview. Eventually a sample of 56 farmers was selected for in-depth interviews using this snowball method. Based on this, we modified and improved the questionnaires designed for livelihood risk types, livelihood risk severity perception, and livelihood risk coping preferences of farmers. We conducted a formal survey in January–February 2018. In this survey, we utilized the stratified random sampling method to select interviewed farmers, and then employed participatory rural appraisal (PRA) data collection tools, such as questionnaire survey, observation, and focus group, to obtain information. Local Tibetan university students were hired as language interpreters. Each survey lasted 30–40 min. A total of 575 surveys were conducted. 528 valid questionnaires were returned with an effective rate of 91.82%, including 56 in purely pastoral areas, 251 in farming-pastoral areas, and 221 in farming areas.

The contents of the questionnaire mainly included: (1) basic information of farmers, including age, gender, education level, human capital, social capital, physical capital and psychological capital, etc.; (2) livelihood risks faced by farmers and their perceptions of the severity of livelihood risks and livelihood risk coping preferences. The main research questions included: “What livelihood risks has your family encountered in the past five years?”;
“How do you perceive the severity of various livelihood risks when faced with many livelihood risks?”; and “What types of livelihood risks do you prioritize?”, etc.

2.3. Characteristics of Interviewed Farmers

In this survey, there were more female than male respondents. There were more young and middle-aged respondents than other age groups. The overall education level was relatively high. The average farming duration was 23.5 years. The average family size was 5.09 persons/household. The average per capita annual household income was CNY 11,791. There were significant differences in per capita income, average farming years of the head of the household, number of household laborers, and the education level of laborers in different agroecological zones in the eastern margin of the Qinghai-Tibet Plateau region. The number of the male respondents in the farming areas was the greatest, accounting for 70.79%. There were relatively more female respondents in purely pastoral areas than those of other groups. Respondents in farming-pastoral areas were generally older than those of other groups. Respondents in farming areas had relatively higher education levels than those of other groups. Respondents in purely pastoral areas had relatively higher per capita annual household income than that of other groups. Although the number of interviewed households is small, the sample can show the basic situation of farming households in the district, compared with the information in the 2017 Gannan Statistical Yearbook. Therefore, the sample is representative (Table 1).

Table 1. The characteristics of the interviewed farmers.

| Variables                              | PPA (N = 56) | FPA (N = 251) | FA (N = 221) | All Farmers (N = 528) |
|----------------------------------------|--------------|---------------|--------------|-----------------------|
| Gender (%)                             | Male         | 46.43         | 59.36        | 70.79                 | 62.69                 |
|                                        | Female       | 53.57         | 40.64        | 29.41                 | 37.31                 |
| Age (%)                                |              |               |              |                       |                       |
| ≤29 years old                          | 58.92        | 50.19         | 48.42        | 50.38                 |
| 30–39 years old                        | 8.93         | 14.74         | 20.81        | 16.67                 |
| 40–49 years old                        | 25           | 23.51         | 21.27        | 22.73                 |
| 50–59 years old                        | 5.36         | 10.76         | 6.79         | 8.52                  |
| ≥60 years old                          | 1.79         | 0.80          | 2.71         | 1.70                  |
| Education (%)                          |              |               |              |                       |                       |
| Illiteracy                             | 15.06        | 18.08         | 15.83        | 17                    |
| Elementary school                      | 50.21        | 45.75         | 42.42        | 44.86                 |
| Junior middle school                   | 20.08        | 20.43         | 23.09        | 21.24                 |
| High school or technical school        | 7.53         | 4.40          | 6.71         | 5.72                  |
| College and above                      | 7.11         | 11.34         | 11.95        | 11.14                 |
| Farming duration (years)               | 25.84        | 25.18         | 21.05        | 23.50                 |
| Family size (person)                   | 4.84         | 5.25          | 4.77         | 5.09                  |
| Per capita annual income (CNY)         | 13612        | 10512         | 9727         | 11791                 |
| Number of laborers (person)            | 3.62         | 3.77          | 3.48         | 3.64                  |
| Head of household average age (year)   | 47.05        | 45.46         | 44.89        | 45.47                 |

2.4. Reliability and Validity of the Questionnaire

In order to ensure the accuracy and scientific nature of the questionnaire survey results, we first used SPSS22.0 software to test the reliability of the questionnaire data. The results show that the Cronbach’s $\alpha$ value of the questionnaire was 0.894, and the Cronbach’s $\alpha$ value of each latent variable was 0.772–0.891. This indicates that the questionnaire has good reliability. In addition, the validity of the questionnaire was evaluated through the KMO and Bartlett sphere test. The results show that the KMO value of all independent variables was 0.922, and the value of the Bartlett sphere test was 0.000 < 0.01. This indicates that the variable has a good structural validity.
2.5. Methods
2.5.1. Livelihood Risk Survey

Livelihood risk refers to the impact that farmers face adversely affecting their production and life [1]. Based on the livelihood capital structure in the Sustainable Livelihoods Framework, and drawing on the UNISDR definition of relevant risks [2,4], with reference to the farmers’ livelihoods risk assessment model [3,4] combined with the actual situation in the eastern margin of the Qinghai-Tibet Plateau, this paper classifies livelihood risks into health risks, environmental risks, financial risks, social risks, household capacity building risks, and policy risks. Among them, environmental risks include natural risks (R1), degradation of pasture/cultivated land quality (R2), difficulties in drinking water for humans/animals (R3), and crop pests and diseases (R4). Health risks include major diseases for oneself or family members (R5), and diseases for livestock (plague) (R6). Financial risks include price decline of farming/pastoral products (R7), difficulties in marketing farming/pastoral products (R8), and purchase of fake farming products (fake seeds or fertilizers) (R9). Social risks include difficulties in pension security (R10), difficulties in children’s employment (R11), ethnic custom risks (high bride price for children’s marriage) (R12) and high expenses for death of a family member (R13). Family capacity building risks include high school fees for children (R14), and high cost of building new houses/remodeling old houses (R15). Policy risks include changes in the policy of returning grazing land to grassland/farmland to forest (R16).

2.5.2. Measurements of Livelihood Risk Perception

We introduced a risk severity perception index. It is used to quantitatively analyze the impact of perceived livelihood risk severity on livelihood risk coping preferences of farmers in the eastern margin of the Qinghai-Tibet Plateau. The perceived severity of each type of livelihood risk was first assigned to farmers, and then the perceived severity of each type of risk was weighted and averaged separately for farmers. The severity perception index is as follows:

$$G_j = \frac{1}{n} \sum_{i}^n g_{ij}$$  \hspace{1cm} (1)

In the formula, \(G_j\) is the severity perception index of the problem \(j\) of the farmers. \(g_{ij}\) is the evaluation value of the severity perception of the problem \(j\) of the \(i\)-th farmer. \(n\) is the number of farmers.

2.5.3. Binary Logistic Model

The explanatory variable of this paper is “whether to prioritize coping with this type of livelihood risk?”, which is a dichotomous variable. Therefore, we analyzed the key factors for the risk coping preferences of farmers through a binary logistic model. The calculation formula is as follows:

$$P_i = \frac{\text{Exp}(\beta_0 + \beta_1 x_{i1} + \cdots + \beta_m x_{im})}{1 + \text{Exp}(\beta_0 + \beta_1 x_{i1} + \cdots + \beta_m x_{im})}$$ \hspace{1cm} (2)

In the formula, \(\beta_0\) is a constant, \(\beta_1, \beta_2, \ldots, \beta_m\) are regression coefficients, representing the contribution of each variable \(x_{im}\) to \(p_i\).

3. Results
3.1. Livelihood Risks of Farmers

In the past five years, 92.80% of farmers in the eastern margin of the Qinghai-Tibet Plateau have faced multiple risks (Figure 2). Among them, farmers facing family capacity building risks accounted for the highest proportion of interviewed farmers, at 47.82%, followed by health risks and social risks. Further analysis revealed that the proportion of environmental risks, health risks, financial risks, social risks and family capacity building risks in farming-pastoral areas were greater than those of purely pastoral and farming
areas. Among them, 52.99% of the farmers facing the risk of family capacity building were exposed, which was 24.42% and 6.16% higher than that of the surveyed households in pure pastoral areas and agricultural areas, respectively. The proportion of farmers facing health risks was 46.22%. It was 2.47% and 4.36% greater than that of purely pastoral and farming areas, respectively. However, purely pastoral farmers had the highest rate of family member illness, which is closely related to the living environment of the local population. The proportion of farmers facing policy risks in farming areas was 10.41%. It was 8.62% and 1.25% greater than that of purely pastoral and the farming-pastoral areas, respectively.

![Figure 2](image)

**Figure 2.** Farmers have faced livelihood risk in the eastern margin of the Qinghai-Tibet Plateau.

From the perspective of different education levels (Figure 2), the proportion of farmers with low education level facing health risks, environmental risks, financial risks, and social risks is greater than that of farmers with middle education level and high education level. Research revealed that 46.49% of farmers with a low education level faced health risks. This is 1.27% and 5.63% greater than that of farmers with middle education levels and high education levels, respectively. Of those with low education levels, 25.14% of farmers faced environmental risk. This is 5.87% and 5.65% greater than that of farmers with middle education levels and high education levels, respectively. Of those with low education levels, 24.60% of farmers faced social risks. This is 6.13% and 2.96% greater than that of farmers with middle education levels and high education levels, respectively. However, the proportions of farmers with high education levels faced family capacity building risks and policy risks was greater than that of farmers with low education levels and middle education levels. Of those with high education levels, 51.34% of farmers faced family capacity building risks. This is 4.31% and 6.75% greater than that of the farmers with low education levels and middle education levels.

### 3.2. Livelihood Risk Coping Preferences of Farmers

In the eastern margin of the Tibetan Plateau, when farmers faced multiple livelihood risks, health risk cope preferences were the strongest. It was revealed that 46.56% of farmers prioritize health risks. The second highest risk coping preference is family capacity building. Only 23.18% of farmers give priority to this risk coping preference (Figure 3). Further analysis shows that the health risk coping preferences of farmers in farming areas are stronger than that of farmers in purely pastoral, and farming-pastoral areas. In farming areas, 51.13% of farmers give priority to health risks, while only 46.43% and 41.04% in purely pastoral, and farming-pastoral areas, respectively. However, farmers in farming-pastoral
areas have the strongest coping preferences for family capacity building risks. Additionally, 26.69% of farmers in farming-pastoral areas give priority to family capacity building risks, while the figures were 23.21% and 19.00% in purely pastoral and farming areas, respectively. Farmers in purely pastoral areas have no ability to cope with environmental risks and policy risks.

**Figure 3.** Livelihood risk coping preferences of different types of farmers in the eastern margin of the Qinghai-Tibet Plateau.

From the perspective of education level, farmers with high education on the eastern edge of the Qinghai-Tibet Plateau have a stronger coping preference for health risks and social risks than farmers with low and medium education (Figure 3). Of farmers with low, middle, and high education levels, 44.86%, 45.22%, and 47.31% give priority to health risks, respectively. Of farmers with low, middle and high education levels, 18.92%, 19.11%, and 19.89% give priority to social risks, respectively. However, farmers with low education levels show a stronger preference to cope with family capacity building risks than those with middle and high education levels. Of low education level farmers, 25.95% give priority to family capacity building risks. In contrast, the proportions of middle and high education level farmers giving priority to family capacity building risks were 20.38% and 22.58%, respectively.

From a gender perspective, females are more willing to cope with health risks and family capacity building risks than males. It was revealed that 46.19% of females and 45.62% of males are willing to cope with health risks. Additionally, 28.93% of females and 19.64% of males are willing to cope family capacity building risks. However, males have stronger preferences for coping with social, environmental and financial risks than females. It was revealed that 19.64% of males are willing to cope with social risks. This is 0.35% greater than females.

### 3.3. Key Factors That Affect Livelihood Risk Coping Preferences

Previous studies have shown that the livelihood risk coping preferences of farmers are not only affected by individual characteristics, but also by the external environment and risk perception [6,17,42–49]. For example, empirical evidence shows that risk preferences of investors are affected by various emotions such as anger, worry, and others [50–52]. Jin et al. showed that females are more inclined to avoid risk than males [17]. Nielsen et al. reported that the important factors for risk preference are gender, age, education level, social networks, etc. [18]. Therefore, this paper selects types of livelihood risk severity perception and livelihood capital as factors (Table 2). Human capital includes the overall farmer labor capacity and educational level. Natural capital includes the per capita cultivated
land area and per capita grassland area. Physical capital includes the number of fixed assets and number of livestock owned by farmers. Social capital includes the level of participation in community organizations, the number of people who actively lend a hand when encountering difficulties, and the level of trust among villagers. Financial capital is characterized by per capita annual income and access to cash assistance. Psychological capital reflects changes in cognition and value, including psychological states such as self-esteem, self-confidence, etc. [53]. It includes the life satisfaction and ability to deal with emergencies. In this paper, a comprehensive index of each variable was obtained by the dimensionless weighted average of each variable through the range standardization method [54]. The key factors for farmers’ livelihood risk coping preferences was analyzed through the binary-logistic regression model. Among them, Model 1, Model 2 and Model 3 are the models for the coping preferences of health risks, social risks, and family capacity building risks, respectively. Despite fully acknowledging that many factors contribute to coping preference, this article mainly focuses on the significant factors.

Table 2. Description of explanatory variables.

| Dimensions                        | Coded Values                                                                 | Mean   | SD   |
|-----------------------------------|-----------------------------------------------------------------------------|--------|------|
| Age                               | -                                                                           | 32.23  | 12.41|
| Gender                            | Male 1, female 0                                                            | 0.63   | 0.48 |
| Environmental risk severity perception | How serious do you think are the adverse consequences of livelihood risks? |        |      |
| Health risk severity perception    | Very serious = 5, more serious = 4, general = 3, less serious = 2, not serious = 1 | 3.36   | 0.59 |
| Family capacity building risk severity perception | Very serious = 5, more serious = 4, general = 3, less serious = 2, not serious = 1 | 3.52   | 0.70 |
| Financial risk severity perception |                                                                            | 3.24   | 0.65 |
| Social risk severity perception    |                                                                            | 3.33   | 0.64 |
| Policy risk severity perception    |                                                                            | 3.22   | 0.89 |
| Human capital                      | Overall farmer workforce capacity                                         | 3.64   | 1.12 |
| Educational level for the workforce | Illiteracy = 0, elementary school = 0.25, junior middle school = 0.5, high school or technical school = 0.75, college and above = 1 | 1.47   | 0.78 |
| Natural capital                   | Cultivated land (acre) per capita cultivated land area (per person/ha)      | 0.09   | 0.1  |
|                                  | Grassland (ha) per capita grassland area (per person/ha)                    | 0.24   | 1.2  |
| Physical capital                  | Number of farmer fixed assets ownership proportion of the number of asset items owned by the survey farmer in the listed options | 0.37   | 0.16 |
|                                  | Number of livestock horse/mule = 1.0, cattle = 0.8, sheep = 0.3, pigs = 0.2 | 27.71  | 268.66|
| Social capital                    | How many community organizations have you participated in? four community organizations and above = 1, three community organizations = 0.75, two community organizations = 0.5, one community organization = 0.25, no participation = 0 | 0.33   | 0.18 |
|                                  | What extent do you trust in village farmers? a lot of trust = 1, more trust = 0.75 general = 0.5, less trust = 0.25, no trust = 0 | 0.67   | 0.18 |
|                                  | Number of relatives and friends who provide help when you are in trouble? almost all = 1, most = 0.75, half = 0.5, less = 0.25, almost none = 0 | 0.70   | 0.18 |
| Financial capital                 | Per capita annual income (CNY)                                             | 11791  | 17947|
3.3.1. Factors Affecting Health Risk Coping Preferences

Model 1 examines the relationship between health risk coping preferences and the variables. The results show that the Hosmer–Lemeshow chi-square value is 5.939 (<15.507), with a significance level of 0.654 (>0.05), and the prediction accuracy is 59.1%, indicating a good fit (Table 3). Specifically, the health risk severity perception has a positive effect on health risk coping preferences, passing the 0.1 significance level test. This shows that the probability of a farmer’s health risk coping preference is increased by 1.467 times for each unit increase in the farmer’s health risk severity perception. Both human capital and environmental risk severity perception have a significant negative effect on health risk coping preferences. When farmers face multiple risks, the probabilities of health risk coping preferences are decreased by 0.083 and 0.640 times for each unit increase in the farmer’s human capital and environmental risk severity perception, respectively.

3.3.2. Factors Affecting Social Risk Coping Preferences

Model 2 examines the relationship between social risk coping preferences and the variables. The results show that the Hosmer–Lemeshow chi-square value is 9.470 (<15.507) with a significance level of 0.304 (>0.05), and the prediction accuracy is 80.9%, indicating a good fit (Table 3). Specifically, both human capital and social capital have a positive effect on farmers’ social risk coping preferences, and passed the 0.01 and 0.05 significance level tests, respectively. This indicates that the probability of farmers’ social risk coping preferences is increased by 47.217 times and 11.746 times for each unit increase in the human capital and social capital, respectively. If farmers’ perceived severity of ecological policy and family capacity building increase by one unit, the probability of their social risk response preference when faced with multiple risks will decrease by 0.675 and 0.687 times, respectively. This indicates that the perceived severity of policy risk and household capacity building risk has a significant negative impact on farmers’ social risk response preference.

3.3.3. Factors Affecting Risk Coping Preferences for Family Capacity Building

Model 3 examines the relationship between family capacity building risk coping preferences and the variables. The results show that the Hosmer–Lemeshow chi-square value is 5.488 (<15.507) with a significance level of 0.704 (>0.05), and the prediction accuracy is 76.9%, indicating a good fit (Table 3). Specifically, the policy risk severity perception has a positive effect on family capacity building risk coping preferences and passed the 0.05 level significance test. This shows that the probability of family capacity building risk coping preferences is increased by 1.376 times for each unit increase in farmers’ policy risk severity perception. Gender and social capital have a significant negative effect on family capacity building risk coping preferences. Gender and social capital have a significant negative effect on family capacity building risk coping preferences. This shows that women are more willing to deal with family capacity building risks than men. In addition, the probability of a family capacity building risk coping preferences is decreased by 0.073 times for each unit increase in a farmer’s social capital.

### Table 2. Cont.

| Dimensions                          | Coded Values                                      | Mean | SD  |
|-------------------------------------|--------------------------------------------------|------|-----|
| Psychological capital               | Are you satisfied with your present life?         | very satisfied = 1, more satisfied = 0.75, average = 0.5, more disappointed = 0.25, very disappointed = 0 | 0.67 | 0.22 |
| How is your ability to deal         | How is your ability to deal with emergencies?     | very good = 1, better = 0.75, average = 0.5, poor = 0.25, very poor = 0 | 0.64 | 0.2  |
Table 3. Test results of key factors affecting farmers’ livelihood risk cope preference in the eastern margin of the Qinghai-Tibet Plateau.

| Variables                               | Model 1 | Model 2 | Model 3 |
|-----------------------------------------|---------|---------|---------|
|                                         | Estimate| Std. Err.| Wald-Value | Exp (B) | Estimate| Std. Err.| Wald-Value | Exp (B) | Estimate| Std. Err.| Wald-Value | Exp (B) |
| Gender                                  | −0.006  | 0.194   | 0.01     | 0.994   | −0.027  | 0.249   | 0.012     | 0.973   | −0.557 **| 0.228   | 5.998     | 0.573   |
| Environmental risk severity Perception  | −0.446 *| 0.242   | 3.398    | 0.640   | 0.465   | 2.316   | 1.592     | −0.105  | 0.282   | 0.139   | 0.900     |         |
| Health risk severity perception         | 0.383 * | 0.197   | 3.778    | 1.467   | −0.185  | 0.244   | 0.575     | 0.831   | −0.316  | 0.224   | 2.001     | 0.729   |
| Farmer capacity building risk severity perception | 0.216   | 0.172   | 1.588    | 1.241   | −0.375 *| 0.214   | 3.072     | 0.687   | 0.130   | 0.203   | 0.410     | 1.139   |
| Policy risk severity perception         | −0.015  | 0.122   | 0.016    | 0.985   | −3.393 **| 0.157   | 6.271     | 0.675   | 0.319 **| 0.146   | 4.810     | 1.376   |
| Human capital                           | −2.483 ***| 0.843  | 8.681    | 0.083   | 3.855 ***| 1.009   | 14.595    | 0.376   | 0.966   | 0.0152  | 1.457     |         |
| Social capital                          | −0.219  | 0.823   | 0.071    | 0.803   | 2.464 **| 1.068   | 5.320     | 11.746  | −2.620 ***| 1.006   | 6.786     | 0.073   |
| Constant                                | −0.717  | 0.933   | 0.590    | 0.488   | −3.184  | 1.198   | 7.060     | 0.041   | 1.711   | 1.115   | 2.357     | 5.536   |
| Hosmer–Lemeshow                          | 5.939   |         | 9.470    | 5.488   |         |         |          |         |         |         |           |         |
| Sig. value                              | 0.654   |         | 0.304    | 0.704   |         |         |          |         |         |         |           |         |
| Prediction accuracy/%                   | 59.1    |         | 80.9     | 76.9    |         |         |          |         |         |         |           |         |

Notes: *, **, *** indicate statistical significance at the 1%, 5%, and 10% levels, respectively.
4. Discussion

4.1. Spatial Heterogeneity of Livelihood Risks

The highest risk faced by farmers was the family capacity building risk, at 48.72%, followed by the health risk. This is basically consistent with existing studies. Wan et al. pointed out that the main livelihood risks faced by farmers on the Gannan plateau were health, education, and employment risks [37]. The first reason is that in the eastern margin of the Qinghai-Tibet is a Tibetan area a region inhabited by Tibetans and has a special cultural background. Due to insufficient emphasis on education in the past, more than 61.86% of the people in this district have only received primary education or are illiterate. However, farmers have gradually changed their concept of children going to school in recent years and are willing to send their children to school in the county. Farmers hope that by investing heavily in children’s education, they will be able to lift themselves out of poverty and be able to interrupt intergenerational poverty through knowledge in the future [55]. The second is that the economic development in this district is low, and the income of farmers is generally low. In addition, many middle schools are concentrated in county areas, and rural students had to choose boarding or rented accommodation near their schools, resulting in an increased burden on education [56]. Therefore, the family capacity building risk is the main risk faced by the households.

However, the proportion of farmers facing family member illness in the purely pastoral areas is greater than that of other regions. This is also generally consistent with existing studies. Zhang et al. pointed out that the incidence of respiratory diseases among farmers in the eastern margin of the Qinghai-Tibet Plateau was greater than that in the plains [57]. The disease is also the second leading cause of death in the district. The first reason is that there is a more prominent and colder highland environment in purely pastoral areas than that of other regions. Furthermore, the area has a special climatic background. As a result, purely pastoral farmers were more likely to suffer from respiratory diseases [58]. The second reason is that the medical and health conditions in the district are inadequate. In addition, problems involving a long distance of travel to see a doctor and expensive medical treatment are prominent [37]. These lead to more serious long-term health effects for farmers, especially those over middle age. As a result, illness of family members is the most significant risk faced by purely pastoral areas.

4.2. The Effect of Gender on Risk Coping Preferences

Men are more inclined to cope with financial and environmental risks than women. This is related to the long-term involvement of men in agriculture and animal husbandry. The reason is that they can use different resources. For example, men are mainly cultivating/grazing land, buying farming products, selling farm products, etc. [18]. Therefore, they believe environmental risks have a significant impact on the farming industry, and financial risks are an important factor affecting farmer income. Therefore, men are more willing to prioritize environmental and financial risks.

Gender has a significant impact on family capacity building risk preferences, i.e., women are more willing to prioritize family capacity building risks than men. This is consistent with existing research as well. Nielsen et al. pointed out that gender is an important factor for risk preferences [18]. The reason may be that men and women play traditional social roles. Among them, men are responsible for matters outside the home, while women are in charge of chores and raising children [59]. Therefore, they make a major priority of their children’s education. Not only did neighbors’ children obtain a decent job after school, but their quality of life is also greatly improved. This has prompted more and more mothers to improve the education level of their children. In the survey, a middle-aged woman said: “Nowadays, some university students come back to work in the government, hospitals and schools after graduation. I will also make sure my children go to university, no matter how difficult it is. I hope she/he will have a good job and comfortable life in the future”.
4.3. The Effect of Risk Perception on Risk Coping Preferences

When farmers are faced with multiple livelihood risk shocks, their risk coping preferences are also different, because of different individual characteristics and livelihood risk perceptions. Health risk severity perception has a significant effect on farmers’ health risk coping preferences. Policy risk severity perception has a significant effect on both social risk coping preferences and family capacity building risk coping preferences. This is consistent with existing research. Jin et al. pointed out that farmers’ risk attitudes play an important role in farming production decisions [17]. Tam et al. (2013) showed that risk perception is significantly negatively related to adaptation policy preferences, i.e., [15]. Risk perception is the key factor among preferences [60]. Gerber and Neeley presented that the perceived risk has an important impact on citizens preferences for hazard management policies [61]. White and Harris found that higher “perceived severity” scores were associated with increased preferences for restrictions on the use of hand-held mobiles while driving [62]. Dachary-Bernard et al. found that latent class logit modelling reveals the heterogeneity of preferences via two classes depending on risk perception [63]. Therefore, farmers’ risk perceptions largely guide farmers’ behavior; for example, the higher the farmer’s health risk severity perception is, the stronger is willingness to cope with health risks.

4.4. Impact of Livelihood Capitals on Risk Coping Preferences

Social capital is an important factor for both social risk and family capacity building risk coping preferences. Wang and Huang found that farmers with better social capital were more willing to cope with risk [64], because the endowment of farmers’ livelihood capital directly affects their ability to cope with livelihood risks [1]. Better social capital makes it easier to solve difficulties with a stronger ability to cope with social risks. In rural areas of China, especially ethnic minority areas, acquaintance circles based on geography and kinship are prevalent. In addition, this area is a concentrated ethnic minority area and network relationships are very close based on blood, marriage, and religious beliefs [41]. However, strong loyalty may hinder the economic growth of the family [18]. This paper finds a significant negative effect of social capital on family capacity building. This indicates that the probability of family capacity building risk coping preferences is decreased by 0.073 times for each unit increase in a farmer’s social capital.

Individual human capital has a significant relationship with risk preferences [65]. The owner of human capital is also increasingly becoming the real risk taker [66]. Zhao Ying found that in the labor market, the human capital of the children and father’s human capital in the family have significant changes in the risk preferences of children, before and after they enter work [67] Liu Qi argued that there is heterogeneity in the role mechanism of human capital in different types of entrepreneurship, with human capital being positively related to employer entrepreneurship in relative terms [65]. This paper finds that human capital is a key factor influencing social risk coping preferences. This indicates that the probability of farmers’ social risk coping preferences is increased by 47.217 times for each unit increase in the human capital.

5. Conclusions

Identifying farmers livelihood risk coping preferences not only provide insights into the mechanisms of farmers’ livelihood risk coping preferences, but also provides a scientific basis and reference for an effective livelihood risk prevention system in the eastern margin of the Qinghai-Tibet Plateau. This paper analyzes the livelihood risk preferences of farmers in the eastern margin of the Qinghai-Tibet Plateau using descriptive statistics and binary logistic regression. The main findings are as follows.

(1) Farmers are mainly faced with family capacity building risks, health risks, and social risks in the eastern margin of the Qinghai-Tibet Plateau.

(2) Farmers have the strongest health risk coping preferences in the eastern margin of the Qinghai-Tibet Plateau. This is followed by family capacity building risk coping preferences, and social risk coping preferences. Farmers’ livelihood risk coping preferences
vary from region to region. In particular, although the proportion of both health risks and social risk coping preferences of farmers in farming areas is greater than in that in purely pastoral and farming-pastoral areas, the greatest proportion of family member illness risk is in purely pastoral areas. The proportion of family capacity building risk coping preferences of farmers in farming-pastoral areas is greater than that in other regions.

(3) From a gender perspective, females are more willing to cope with health risks and family capacity building risks than males. However, males have stronger preferences for coping with social, environmental and financial risk than females. From the perspective of education level, farmers with high education on the eastern edge of the Qinghai-Tibet Plateau have a stronger coping preference for health risks and social risks than farmers with low and medium education.

(4) Human capital, health risk severity perceptions, and environmental risk severity perceptions are the key factors affecting farmers’ health risk coping preferences. Social capital, gender, and policy risk severity perceptions are key factors influencing family capacity building risk coping preferences of farmers. Social capital, human capital, policy risk severity perceptions, and family capacity building risk severity perceptions are key factors for the social risk coping preferences of farmers.

Therefore, we put forward the following suggestions to improve the livelihood sustainability of families in the eastern margin of the Qinghai-Tibet Plateau. The medical security system should be further improved, and health knowledge should be vigorously promoted. In addition, farmers should be encouraged to actively participate in sports and adjust their dietary habits. Not only can this lead to farmers having less or no diseases, but it can also cure diseases and afford medical expenses, etc. Second, it is necessary to strengthen educational and public activities, increase the cultural capital of the family, and attach importance to knowledge investment. Third, the government should strengthen the construction of local grassroots organizations, improve the guarantee of farmers’ participation in village collective affairs, and raise the standard of Mandarin of Tibetan farmers. In addition, the government should guide farmer labor export and expand the network of migrant workers. Fourth, it is necessary to train farmers to help them make rational choices to cope with risks. The district needs to reduce policy risks to help farmers overcome livelihood risks and improve their quality of life.

Although this paper provides the formulation of livelihood risk prevention at the micro level, there are still some shortcomings. We only explored the impact of each factor on the choice of farmers’ adaptation strategies. The impact of multiple factor interactions on livelihood risk coping preferences needs to be further studied.

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

**Funding:** This research was funded by Strategic Priority Research Program of the Chinese Academy of Science (Class A) under Grant No. XDA19040502; National Nature Sciences Foundation of China under Grant No. 41971268; Fundamental Research Funds for the Central Universities under Grant No. 2021TS018.

**Institutional Review Board Statement:** Ethical review and approval were waived for this study, as the details about the participants have been anonymized, and there is minimal risk associated with this research. Besides, the written informed consent for publication has been obtained from all participants.

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** Not applicable.

**Conflicts of Interest:** The authors declare no conflict of interest.
References

1. Zhao, X.Y.; Jie, Y.Q.; He, X.F.; Mu, F.F.; Su, H.Z.; Lan, H.X.; Xue, B. Livelihood adaptability of farmers in key ecological functional areas under multiple pressures. China Popul. Resour. Environ. 2020, 30, 140–149. [CrossRef]

2. Zhao, X.Y.; Mu, F.F.; He, X.F.; Su, H.Z.; Jie, Y.Q.; Lan, H.X. Livelihood vulnerability of farmers in key ecological function area under multiple stressors: Taking the Yellow River water supply area of Gannan as an example. Acta Ecol. Sin. 2020, 40, 7479–7492. [CrossRef]

3. Gao, Z.Y.; Zhao, X.Y.; Lan, H.X.; Shi, Y.Z. The impact of multiple pressures on the availability of farmers’ livelihood assets in key ecological functional areas: A case study of the Yellow River Water Supply Area of Gannan. Geogr. Res. 2020, 39, 150–163. [CrossRef]

4. Shameem, M.I.; Montaz, 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]

5. Ma, Y.Y.; Zhao, X.Y.; Lan, H.X.; Xue, B. Livelihood risk multi-dimensional perception and influencing factors in key ecological function area: A case of the Yellow River Water Supply Area of Gannan. Acta Ecol. Sin. 2020, 40, 1810–1824. [CrossRef]

6. Brauw, A.D.; Ezenou, P. Measuring risk attitudes among Mozambican farmers. J. Dev. Econ. 2014, 111, 61–74. [CrossRef]

7. 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]

8. 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]

9. Zhao, X.; Zhao, H.; Liu, C. The farmers’ livelihood risk and their coping strategy in the downstream of Shiyang River: A case of Minqin Oasis. Geogr. Res. 2015, 34, 922–932. [CrossRef]

10. Prado, D.S.; Seixas, C.S.; Berkes, F. Looking back and looking forward: Exploring livelihood change and resilience building in a Brazilian coastal community. Ocean. Coast. Manag. 2015, 113, 29–37. [CrossRef]

11. Fang, Y.; Zhu, F.; Qiu, X.; Zhao, S. Effects of natural disasters on livelihood resilience of rural residents in Sichuan. Habitat Int. 2018, 76, 19–28. [CrossRef]

12. Tong, L.; Zheng, K.; Su, F. Concept, analytical framework and assessment method of livelihood vulnerability. Adv. Earth Sci. 2020, 35, 209–217. [CrossRef]

13. Yan, J.; Yu, O.; Wu, Y.; Zhang, Y. Livelihood vulnerability assessment of farmers and nomads in eastern ecotone of Tibetan Plateau, China. Sci. Geogr. Sin. 2011, 31, 858–867. [CrossRef]

14. Liu, Z.; Guan, X. Risk taking and Firm Performance: The Financial logic of “Winning in Risk”. Financ. Account. Mon. 2021, 22, 12–20. [CrossRef]

15. Tam, J.; McDaniels, T.L. Understanding individual risk perceptions and preferences for climate change adaptations in biological conservation. Environ. Sci. Policy 2013, 27, 114–123. [CrossRef]

16. Singh, C.; Rahman, A.; Srivinas, A.; Bazaz, A. Risks and responses in rural India: Implications for local climate change adaptation action. Clim. Risk Manag. 2018, 21, 52–68. [CrossRef]

17. Jin, J.J.; Gao, Y.W.; Wang, X.M.; Nam, P.K. Farmers’ risk preferences and their climate change adaptation strategies in the Yongqiao District, China. Land Use Policy 2015, 47, 365–372. [CrossRef]

18. Nielsen, T.; Keil, A.; Zeller, M. Assessing farmers’ risk preferences and their determinants in a marginal upland area of Vietnam: A comparison of multiple elicitation techniques. Agric. Econ. 2013, 44, 255–273. [CrossRef]

19. Mohan, S. Risk aversion and certification: Evidence from the Nepali tea fields. World Dev. 2020, 129, 104903. [CrossRef]

20. Nie, X.; Zhou, J.; Cheng, P.; Wang, H. Exploring the differences between coastal farmers’ subjective and objective risk preferences in China using an agent-based model. J. Rural. Stud. 2021, 82, 417–429. [CrossRef]

21. Kugler, T.; Connolly, T.; Ordoñez, L.D. Emotion, decision, and risk: Betting on gambles versus betting on people. J. Behav. Decis. Mak. 2012, 25, 123–134. [CrossRef]

22. He, R.; Jin, J.J.; Gong, H.Z.; Tian, Y.H. The role of risk preferences and loss aversion in farmers’ energy-efficient appliance use behavior. J. Clean. Prod. 2019, 215, 305–314. [CrossRef]

23. Aravindakshan, S.; Krupnik, T.J.; Amjath-Babu, T.S.; Speelman, S.; Tur-Cardona, J.; Tittonell, P.; Groot, J.C.J. Quantifying farmers’ preferences for cropping systems intensification: A choice experiment approach applied in coastal Bangladesh’s risk prone farming systems. Agric. Syst. 2021, 189, 103069. [CrossRef]

24. Gilliam, J.; Chatterjee, S.; Grable, J. Measuring the perception of financial risk tolerance: A tale of two measures. J. Financ. Counseling Plan. 2010, 21, 30–43.

25. Adeboonsuke, V.; Caplanova, A. An analysis of impact of personality traits and mindfulness on risk aversion of individual investors. Curr. Psychol. 2021, 1, 1–18. [CrossRef]

26. Tanaka, T.; Camerer, C.; Nguyen, Q. Risk and time preferences: Linking experimental and household survey data from Vietnam. Am. Econ. Rev. 2010, 100, 557–571. [CrossRef]

27. Hallaham, T.; Fafl, R.; McKenzie, M. An empirical investigation of personal financial risk tolerance. Financ. Serv. Rev. 2004, 13, 57–78.

28. Pan, W.L. Analysis of the factors influencing the risk preference of operators. Mod. Manag. Sci. 2013, 2, 106–108.

29. Ruinquka, R.D.; Alem, Y.; Eggert, H.; Lybbert, T. Smallholder rice farmers’ post-harvest decisions: Preferences and structural factors. Eur. Rev. Agric. Econ. 2020, 47, 1587–1620. [CrossRef]

30. Botzen, W.J.W.; Aerts, J.C.J.H.; vanden Bergh, J.C.J.M. Willingness of homeowners to mitigate climate risk through insurance. Ecol. Econ. 2009, 68, 2265–2277. [CrossRef]
31. Grisleya, W.; Kellogg, E. Risk-taking preferences of farmers in northern Thailand: Measurements and implications. *Agric. Econ.* **1980**, *1*, 127–142. [CrossRef]

32. Frey, R.; Richter, D.; Schupp, J.; Hertwig, R.; Mata, R. Identifying robust correlates of risk preference: A systematic approach using specification curve analysis. *J. Personal. Soc. Psychol.* **2021**, *120*, 538–557. [CrossRef]

33. Torres, M.O.; Kallas, Z.; Herrera, S.O. Farmers’ environmental perceptions and preferences regarding climate change adaptation and mitigation actions; towards a sustainable agricultural system in México. *Land Use Policy* **2020**, *99*, 105031. [CrossRef]

34. Cullen, A.C.; Anderson, C.L.; Biscaye, P.; Reynolds, T.W. Variability in Cross-Domain Risk Perception among Smallholder Farmers in Mali by Gender and Other Demographic and Attitudinal Characteristics. *Risk Anal.* **2018**, *38*, 1361–1377. [CrossRef] [PubMed]

35. Liu, Y.S.; Cao, Z. Supply-side Structural Reform and Its Strategy for Targeted Poverty Alleviation in China. *Bull. Chin. Acad. Sci.* **2017**, *32*, 1066–1073. [CrossRef]

36. Wang, W.Y.; Zhao, X.Y.; Li, H.; Zhang, Q. Will social capital affect farmers’ choices of climate change adaptation strategies? Evidences from rural households in the Qinghai-Tibetan Plateau, China. *J. Rural. Stud.* **2021**, *83*, 127–137. [CrossRef]

37. Wan, W.Y.; Zhao, X.Y.; Wang, W.J.; Xue, B. Farmers’ Livelihood Risk in Ecologically Vulnerable Alpine Region: A Case of Gannan Plateau. *Ecol. Geogr.* **2017**, *37*, 149–157. [CrossRef]

38. Shi, S.X.; Zhou, X.F.; Zhang, Z.L. The Motivation Mechanism, Benefit Analysis and Policy Suggestions of Migrant Settlement in Pastoral Areas: A Case Study of Gannan Tibetan Autonomous Prefecture. *Stat. Res.* **2005**, *3*, 49–52. [CrossRef]

39. Zhao, X.Y. The Impact of Human Factors on the Environmentin Gannan Pasturing Area. *Acta Geogr. Sin.* **2010**, *65*, 1411–1420.

40. Jannat, A.; Islam, M.M.; Alamgir, M.S.; Rafi DA, A.; Ahmed, J.U. Impact assessment of agricultural modernization on sustainable livelihood among tribal and non-tribal farmers in Bangladesh. *Geojournal* **2021**, *86*, 399–415. [CrossRef]

41. Zhang, Q.; Zhao, X.Y.; Luo, L.; Wang, Y.R.; Xue, B. Assessment of the impact of climate change on vulnerability of farmer households’livelihood in an ecologically vulnerable alpine region: Taking Gannan plateau for example. *Chin. J. Ecol.* **2016**, *35*, 781–790. [CrossRef]

42. Jannat, A.; Islam, M.M.; Alamgir, M.S.; Rafi DA, A.; Ahmed, J.U. Impact assessment of agricultural modernization on sustainable livelihood among tribal and non-tribal farmers in Bangladesh. *Geojournal* **2021**, *86*, 399–415. [CrossRef]

43. Hansson, H.; Lagerkvist, C.J. Measuring farmers’ preferences for risk: A domain-specific risk preference scale. *J. Risk Res.* **2012**, *15*, 737–753. [CrossRef]

44. Jin, J.J.; He, R.; Gong, H.Z.; Xu, X.; He, C.Y. Farmers’ Risk Cognition, Risk Preferences and Climate Change Adaptive Behavior: A Structural Equation Modeling Approach. *Int. J. Environ. Res. Public Health* **2020**, *17*, 85. [CrossRef]

45. Micic, T. Risk reality vs. risk perception. *Risk Anal.* **2012**, *32*, 1066–1073. [CrossRef]

46. Doherty, E.; Mellett, S.; Norton, D.; McDermott, T.K.J.; O’Hora, D.; Ryan, M. A discrete choice experiment exploring farmer preferences for insurance against extreme weather events. *J. Environ. Manag.* **2018**, *145*, 27–37. [CrossRef]

47. Ambali, O.I.; Areal, F.J.; Georgantzis, N. Improved rice technology adoption: The role of spatially-dependent risk preference. *Int. J. Environ. Res. Public Health* **2017**, *14*, 713. [CrossRef]

48. Akter, S.; Krupnik, T.J.; Rossi, F.; Khanam, F. The influence of gender and product design on farmers’ preferences for weather- indexed crop insurance. *Glob. Environ. Change* **2016**, *38*, 217–229. [CrossRef]

49. Campos-Vazquez, R.M.; Cuilty, E. The role of emotions on risk aversion: A prospect theory experiment. *J. Behav. Exp. Econ.* **2021**, *11*, 691. [CrossRef]

50. Kusev, P.; Schaić, P.V.; Martin, R.; Hall, L.; Johansson, P. Preference reversals during risk elicitation. *J. Exp. Psychol. Gen.* **2020**, *149*, 585–589. [CrossRef]

51. Kusev, P.; Schaić, P.V.; Martin, R.; Hall, L.; Johansson, P. Preference reversals during risk elicitation. *J. Exp. Psychol. Gen.* **2020**, *149*, 585–589. [CrossRef]

52. Kishor, N. Risk preferences for financial decisions: Do emotional biases matter? *J. Public Aff.* **2020**, *e2360*. [CrossRef]

53. Yi, F. Digital skills, livelihood resilience and sustainable poverty reduction in rural areas. *J. South China Agric. Univ. Soc. Sci. Ed.* **2021**, *20*, 1–13.

54. Luo, L.; Zhao, X.; Wang, Y.; Zhang, Q.; Xue, B. Farmer’perception of climate change based on a structural equation model: A case study in the Gannan Plateau. *Acta Ecol. Sin.* **2017**, *37*, 3274–3285. [CrossRef]

55. Du, M. The Countermeasures of the characteristic industries in the deep poverty area from the perspective of feasible ability: Taking the high-mid-mountains in Sichuan Minority areas as an example. *China Dev.* **2020**, *20*, 54–61. [CrossRef]

56. Li, X.; Tian, X. Analysis of the Current Situation of Secondary Vocational Education Students in Contiguous and Specially Difficult Ethnic Areas: The Case of Gannan Tibetan Autonomous Prefecture. *Contemp. Educ. Res. Teach.* **2016**, *7*, 263–265. [CrossRef]

57. Zhang, S.W.; Wang, H.Y.; Shi, H.H.; Jiang, L.; Chang, L.J.; Chen, L.J.; Xi, J.E. Analysis of potential years of life lost and cause of death in residents of Gannan prefecture in 2019. *Bull. Dis. Control. Prev. Prev.* **2020**, *35*, 1–4. [CrossRef]

58. Liu, J.; Meng, J.; Zhang, W.; Chen, D.; Huang, L.; Lu, S.; Han, J. Characteristics of Disease Spectrum of the Antiaircraft Artillery at High Altitude. *Med. Pharm. J. Chin.* **2012**, *24*, 47–49. [CrossRef]
61. Gerber, B.J.; Neeley, G.W. Perceived Risk and Citizen Preferences for Governmental Management of Routine Hazards. *Policy Stud. J.* 2005, 33, 395–419. [CrossRef]

62. White, M.P.; Eiser, J.R.; Harris, P.R. Risk perceptions of mobile phone use while driving. *Risk Anal.* 2004, 24, 323–334. [CrossRef] [PubMed]

63. Dachary-Bernard, J.; Rey-Valette, H.; Rulleau, B. Preferences among coastal and inland residents relating to managed retreat: Influence of risk perception in acceptability of relocation strategies. *J. Environ. Manag.* 2019, 232, 772–780. [CrossRef] [PubMed]

64. Wang, H.Z.; Huang, J.K. A Study of Farmers’ Risk and Shared Risk Preferences. *Issues Agric. Econ.* 2016, 37, 86–94. [CrossRef]

65. Liu, Q. The Impact of Children’s Human Capital on Entrepreneurship of Floating Population. *J. South China Agric. Univ.* 2019, 18, 96–110. [CrossRef]

66. Fang, Z. Ownership by human capital owners is a trend: A discussion with Dr. Zhang Weiying. *Econ. Res. J.* 1997, 6, 36–40.

67. Zhao, Y. Risk preferences and career choices of Chinese workers. *Econ. Perspect.* 2017, 1, 62–76.