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How Perceived Stress Affects Farmers' Continual Adoption of Farmland Quality Improvement Practices

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Abstract: Regarding the fact that smallholder farmers form the main part of agriculture, actively guiding smallholder farmers to continually adopt the farmland quality improvement practice in their agricultural production process is considered as the critical path to improve farmland sustainability for the agricultural sector in China especially smallholder farmers planting economic crops, such as tea, that have long relied on heavy inputs of chemical fertilizers that seriously undermine the quality of farmland. However, the state efforts towards the promotion of farmers' adoption of farmland quality improvement practices for years have not obtained remarkable results. In this context, based on expectation confirmation theory and conservation of resources theory, the study classified farmers' perceived stress towards continual adoption of farmland quality improvement practice into three categories: stress from uselessness perception, difficulty perception, and in-adaptability perception. A structural equation model was utilized to explore the impact of perceived stress on farmers' continual adoption of the practice in a sample of 494 tea farmers from Qinba Mountain Area in China. Additionally, the mediating effect of self-efficacy and moderating effect of social support are discussed theoretically and empirically in the paper. The research findings show that the stress from in-adaptability perception has the strongest inhibitory effect of the three on farmers' continual behavior while the stress from difficulty perception is the weakest. Further, the mediating effect of self-efficacy in the relationship between perceived stress and farmers' continual adoption behaviors was confirmed. Additionally, the study indicated that social support can buffer the negative impact of perceived stress from uselessness perception and difficulty perception on farmers' continual adoption behaviors. Therefore, fully considering farmers' perceived stress, providing farmers with support in a targeted manner, would strengthen the coordination between the government and the household on farmland improvement practices, accelerating the achievement of farmland sustainability.

Keywords: self-efficacy; social support; expectation confirmation theory; conservation of resources theory; structural equation model

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1. Introduction

Farmland has always been the strong guarantee or constraint for sustainable development of agriculture in all countries [1]. Improving the quality of farmland is a realistic and necessary choice to guarantee the supply of agricultural products and enhance the international competitiveness of agriculture, but also sets a solid foundation for food security [2]. Especially in recent years, due to the severe impact of intense international political situations and COVID-19, the international food supply chain is in an extremely fragile condition, almost out of control. Therefore, improving farmland quality to develop food self-supply ability becomes much more necessary and urgent for a country. As a country who needs to feed around 20% of the world's population with only 9% of the world's farmland [3], China has always attached great importance to the improvement in farmland and treated the improvement in farmland as a matter of prime importance for the development of national economy and livelihood of the people [4]. In 2015, the Chinese government

proposed the following strategy: executing the most stringent farmland protection and improvement policy, treating farmland like it is as rare as the giant panda. In 2017, the Chinese agricultural sector issued the *Action Plan of Farmland Quality Protection and Improvement*, formulating policies on *farmland balance*, laying out the *permanent basic farmland* and dispensing the farmland fertility protection subsidies, so as to implement the most stringent farmland protection and improvement measures which the state describes as "the measures having grown the teeth". Additionally, the forest industry, such as tea growing, is a type of economic crop that is more susceptible to pests or diseases and more fertilizer-dependent than other agricultural products; thus, the extensive production characteristics of excessive application of fertilizers and pesticides in the growing process of economic crops are more obvious. Therefore, 'chemical fertilizer reduction and pesticide reduction' in forest planting is the first priority in China's agricultural green production reform [5]. In 2017, China's National Ministry of Agriculture held the "Fruit, Vegetable, and Tea Fertilizer and Pesticide Reduction and Efficiency Promotion National Conference", setting a goal to reduce the application of fertilizers and pesticides in advantageous regions of fruit, vegetables, and tea production to 50% of the current amount by 2020. All these efforts have gained periodic success in the challenge to protect and improve farmland quality. According to the *National High Standard Farmland Construction Plan (2021–2030)*, China has completed the task to construct 800 million acres of high standard farmland by the end of the year of 2020 [6]. However, the basic national reality that 'lacking of high quality farmland resources and the quality of farmland is low overall' still needs further improvement [7]. As the main subject of agricultural production activity in China, smallholder farmers are the direct participants and stakeholders of farmland improvement practices [8]. Encouraging farmers to actively and continually adopt the farmland quality improvement practice is of great practical significance to ensure the effective supply of agricultural products and promote the sustainable development of agriculture in this country [9].

Extensive studies have been focused on exploring driving forces of farmers' farmland quality improvement adoption [10–13]. Internal factors such as individual or household characteristics [14], farmers' internal knowledge and cognition towards the practice adoption [15], farmers' perception of the practice adoption condition [16], and the external factors such as government regulations and social norms [17] have been acknowledged as the main driving forces for farmers' adoption of farmland quality improvement practices. Scholars are trying to promote farmers' adoption of the practice by strengthening the positive effects of these driving forces. However, there are some deficiencies in the current studies on farmers' adoption of farmland quality improvement practices. On the one hand, when it comes to the study of farmers' adoption of the practices, scholars' attention tends to be occupied by the question of whether the factors result in farmers' adoption, while the continuity of the adoption is always left out. However, only the continuity of farmers' adoption can ensure the genuine improvement in farmland quality [18]. On the other hand, current studies tend to cast much more insight into the factors that facilitate farmers' adoption of the practices while the destructive factors, such as the cost of the practice, gain little attention [19]. However, these destructive factors are particularly worthy of attention in the study of practice continuity [20]. Perceived stress produced by stimulation of "stressors" is one of the key factors hindering an individual's continuity of practice [21]. There are many studies mentioning the "stressors" in farmers' adoption of farmland quality improvement practices. Juan [22] pointed out that the high price of organic fertilizer, small amounts of nitrogen elements in fertilizers, and the slow release rate of the nitrogen element can all increase the possibility of farmers abandoning purchases of environmentally friendly fertilizer. Li Shasha [23] found that the farther the distance of fertilization spots from farmers' residences, the less likely the farmers are to use the formula fertilizer by soil testing. Shi Zhiheng [24] emphasized that government regulation has a significant effect on reducing farmers' application amounts of fertilizer but has no significant effect on farmers' continual adoption of organic fertilizers. Additionally, his further study proved that the longer the time of government and enterprises' technical training for farmers and the greater the

amount household labor required to participate in the training, the more often farmers tend to abandon the continual application of the new practice. Cao [25] believed that high demands for time, space, labor, capital, and technical support in green manure planting will cause pressure on farmers' practice adoption and reduce the possibility of adopting green manure planting technology.

In view of this, the study took 494 tea growers in Qinba Mountain Area as an example, giving a systematic measure of tea farmers' perceived stress towards continual adoption of farmland quality improvement practices, exploring how perceived stress affects tea farmers' continual adoption of the practice with the help of a structural equation model, to further confirm the mediating effect of self-efficacy and moderating effect of social support between perceived stress and farmers' continual adoption of farmland quality improvement, and finally analyze the behavior response law of farmers towards the practice. Regarding the significance of the study, theoretically, the study revealed the stage characteristics of farmers' practice adoption, focusing on their continual adoption behaviors instead of the initial adoption, and studied farmers' continual adoption behaviors from the novel perspective of perceived stress which provided a new concept for related studies. Practically, the study can help the agro-technological system to systematically understand the stress source and stress perception of farmers' continual adoption of farmland quality improvement practices, providing explanations for farmers' low-level adoption of the practice, as well as deepening the system's cognition and understanding of farmers' practice adoption, and finally providing theoretical guidance and empirical support for the promotion of governmental farmland quality improvement policies.

2. Literature Review and Hypotheses

2.1. Farmers' Perceived Stress

Perceived stress is an individual's subjective feeling due to an unbalanced interaction between the external environment and internal psychological state which is mainly caused by the "loss", including actual resources loss, potential threats of resources loss [26], and changes in modes of life or production [27]. According to Expectation Confirmation Theory [28] and Conservation of Resources Theory [29], farmers' dis-confirmation towards the expectation of farmland quality improvement practice is the result of the unbalanced interaction between their actual adoption experience of the practice and their initial expectation towards the practice. The expectation dis-confirmation is caused by the resource loss happening in the process of farmers' adoption of farmland quality improvement practices. Additionally, the "loss" from "profit", "capacity", and "habits" in farmers' actual production processes are the three key stressors to stimulate farmers' perception of stress from the continual adoption of the practice. The greater the loss of resources, the higher the level of the dis-confirmation expectation; farmers are more likely to abandon the farmland quality improvement practice adoption in order to protect and conserve their existing resources. The above theory analysis is shown in Figure 1 in detail.

Farmers' production pursues both the "economic rationality" and "value rationality"; that is, farmers, in their agricultural production, not only expect to meet environment protection requirements, but also the improvement in economic benefits [30]. However, the agricultural production cycle is a comparatively longer period compared with the industry production period, and its input does not necessarily produce the corresponding output, so it requires a lot of time to bring the effect of farmland quality improvement practice into play and the positive externalities of the practice cannot be compensated in the short term [31]. The improvement in farmers' economic and environmental benefits is often not significant after the first adoption of farmland quality improvement practice, which is quite different from farmers' initial expectation. At the time, farmers tend to believe that the adoption of the farmland quality improvement practice is "useless", or even "not worth the candle"; they are more likely to abandon the continual adoption of the practice under the great perceived stress from the initial adoption of the farmland quality improvement practice. Therefore, we propose the following hypothesis:

Hypothesis 1a (H1a). *Stress from uselessness perception has a significant negative impact on farmers' continual adoption of farmland quality improvement practices.*

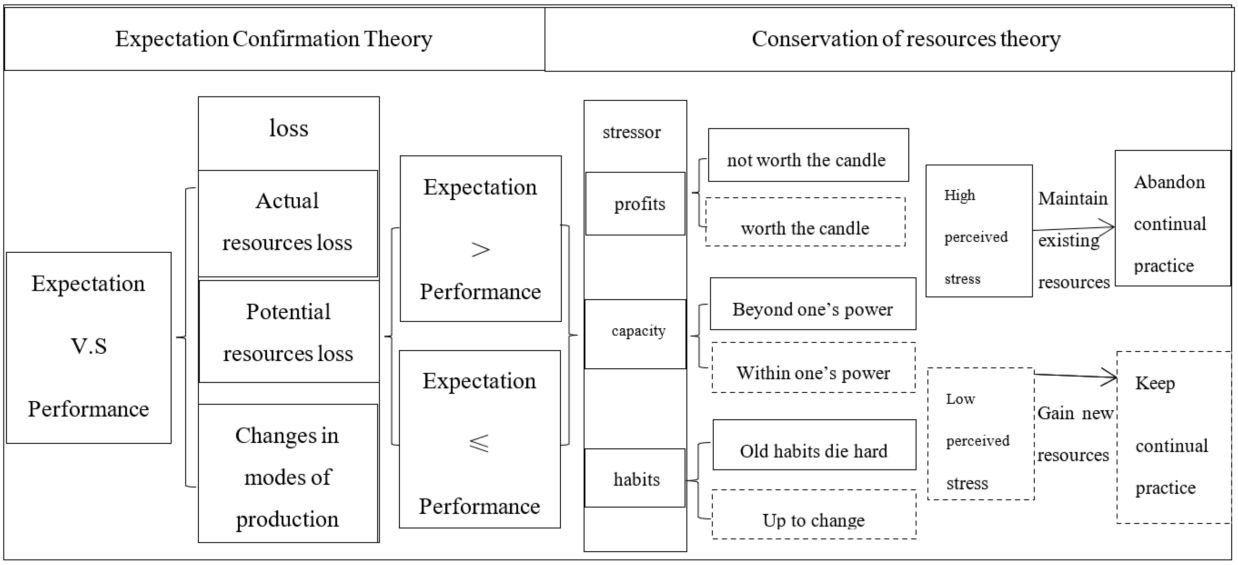

Figure 1. Theoretical framework.

Farmers' capacity to operate the farmland quality improvement practice and the resources farmers own to support the operation of the practice directly affect farmers' adoption of the practice [32]. When implementing the farmland quality improvement practice, farmers with weak learning capacity are more likely to encounter practical difficulties that they did not presuppose before adopting the practice in the process of their first adoption. Additionally, they may face additional resource losses, such as requiring much more time to operate the new technology and money to buy the materials supporting the operation due to their scarcity of experience on the practice of the new means of production. All these would result in farmers' perception of the difficulty of the practice adoption; that is, farmers think that the continual adoption of the practice is beyond their capacity, both in terms of operation and money. Therefore, the greater the stress of farmers due to difficulty perception, the more inclined they are to abandon the continual adoption of farmland quality improvement practices. Therefore, we propose the following hypothesis:

Hypothesis 1b (H1b). *Stress from difficulty perception has a significant negative impact on farmers' continual adoption of farmland quality improvement practices.*

Polites [33] pointed out that an individual's behavior is not "completely rational" when one makes the decision to continue a certain behavior. More specifically, an individual may continue a behavior even though he or she realizes that the continual behavior is not beneficial. The "inertia" plays a key role in the situation. The stronger the "inertia" is, the more intensive an individual's in-adaptability perception is. For Chinese farmers, it has become routine to apply chemical fertilizer with their own production experience [34]. The farmland quality improvement practice requires farmers to abandon their habitual, long-term fertilization use method, to overcome their "inertia" and to adapt to the new scientific fertilization method. "Old habits die hard". It must be a long and hard transformation process. The more incorrigible the farmers' traditional fertilization habits, the stronger the stress from in-adaptability perception that farmers may face in the transformation, and they are more likely to abandon the continual adoption of the farmland quality improvement practice. Therefore, we propose the following hypothesis:

Hypothesis 1c (H1c). *Stress from in-adaptability perception has a significant negative impact on farmers' continual adoption of farmland quality improvement practices.*

2.2. Self-Efficacy

Self-efficacy is an individual's conviction of his or her certain success in finishing a task or conquering a challenge independently, reflecting an individual's ability to self-control. Individuals with strong self-efficacy are usually much more determined in keeping the action which they believe will bring them benefits [35]. According to Hobfoll, an individual under great stress would abandon and stop behaving or would actively motivate their psychological protection mechanism, self-efficacy, to help fight against the great stress. Therefore, the greater the stress, the greater the loss of self-efficacy in coping with stress. Perceived stress negatively affects individuals' self-efficacy. That is, the greater the perceived stress of farmers, the weaker the farmers' conviction to keep adopting the practice. Additionally, the weakening of farmers' conviction to control their continual behaviors will inhibit farmers' continual adoption of cultivated land quality improvement practices. The expectation dis-confirmation on the aspects of "profits", "capacity", and "habits" of the farmland quality improvement practice adoption covers farmers under stress and the stress would have a negative impact on farmers' farmland quality improvement practice adoption through lowering their self-efficacy. Therefore, we propose the following hypotheses:

Hypothesis 2a (H2a). *Stress from uselessness perception inhibits farmers' continual adoption of farmland quality improvement practices through lowering their self-efficacy.*

Hypothesis 2b (H2b). *Stress from difficulty perception inhibits farmers' continual adoption of farmland quality improvement practices through lowering their self-efficacy.*

Hypothesis 2c (H2c). *Stress from in-adaptability perception inhibits farmers' continual adoption of farmland quality improvement practices through lowering their self-efficacy.*

2.3. Social Support

The Job Demand–Resource Theory [36] holds the idea that job demands consume individuals' resources, while the job resources could offset individuals' resources loss caused by the job demand, and then, buffer individual's perceived stress from the resource loss. Social support an example of the resources. It can buffer individuals' perceived stress and weaken the impact of perceived stress on individuals' behavior. According to Estell and Purdue [37], social support can have three dimensions: emotional support, direct material support, and individual's utilization of the support. Emotional support from family members, neighbors, and village cadres can help farmers internalize the values of pursuing both the economic interests and the environmental protection in agricultural production and enhance farmers' self-satisfaction on their continual adoption of the practice [38]. Direct material support such as technical training and subsidies provided by the government could activate farmers' response to the practice. Individuals with high utilization of social support often have higher subjectivity and better psychological adaptability. They are better at transforming external support and resources into internal driving forces for their own development and have better performance in coping with stress [39]. The higher the level of social support, the weaker the impact of perceived stress on farmers' continual adoption of farmland quality improvement practice. Then, we propose the following hypotheses:

Hypothesis 3a (H3a). *Social support moderates the negative impact of stress from uselessness perception on farmers' continual adoption of the farmland quality improvement practice.*

Hypothesis 3b (H3b). *Social support moderates the negative impact of stress from difficulty perception on farmers' continual adoption of the farmland quality improvement practice.*

Hypothesis 3c (H3c). *Social support moderates the negative impact of stress from in-adaptability perception on farmers' continual adoption of the farmland quality improvement practice. The hypothesis model is shown as the Figure 2.*

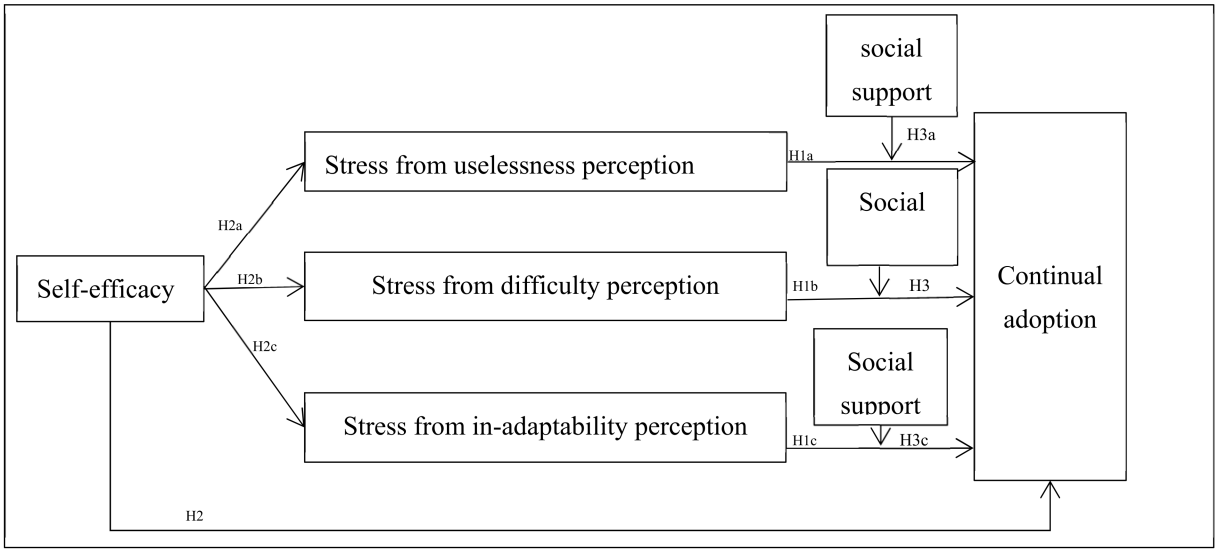

Figure 2. Hypothesis model.

3. Materials and Methods

3.1. Research Area

The data collection for the study was based on the field survey. The research group conducted the survey in Qinba Mountain Area in July 2020. Qinba Mountain Area refers to Qinling-Bashan Mountain and its adjacent areas in the upper reaches of the Han River, the largest tributary of the Yangtze River, especially the main southern part of Shaanxi province. It is the important ecological function reserve and the major poverty alleviation development zone in China. The contradiction between environment protection and economy development in this area is intensive. Due to its unique nature conditions, tea planting has become the leading industry in the region. By 2018, there were 50 tea planting counties in Qinba Mountain Area, with an area of about 450,240 hectares, accounting for around 15.4% of the total area of tea gardens in China. Since the project of *Research and Demonstration of Green Development Technology Integration Modes of Tea Planting* was carried out in 2018, it has been committed to leading the sustainable development of tea planting in Qinba Mountain Area through technological innovation, vigorously promoting land improvement practice in the area. With the government promotion of the practice for 3 years, the sample region meets the necessary conditions (most of farmers had the initial experience of the practice adoption) for farmers' practice adoption that the study needs. Therefore, this area has strong demonstration and representativeness for the study of farmers' continual adoption of the farmland quality improvement practice in the context of the government's promotion of the farmland quality improvement practice.

3.2. Sampling Procedures

The sample selection was first conducted in eight counties with the most extensive reputation of tea planting in Qinba Mountain Area, including Hanbin, Pingli, Xixiang, Ziyang, Wanyuan, Nanzheng, Qingchuan, and Wangcang which are shown in Figure 3; secondly, two to three townships with the longest tea planting history in each county were selected; thirdly, 2–5 villages with large tea planting areas were selected in each town. Finally, 20–30 tea farmers were randomly selected in each village for the household survey. The invalid questionnaires with missing information were eliminated, and the tea farmers' questionnaires with the first adoption of green fertilization technology were screened out.

Finally, 494 questionnaires suitable for this study were obtained. Considering the tea farmers' understanding of the questionnaire items and the knowledge of tea growing, the respondents were all tea-planting decision makers in farmers' families. The research contents contained the individual characteristics, family characteristics, self-efficacy, continual adoption of the farmland quality improvement practice, and social support on the adoption of the practice.

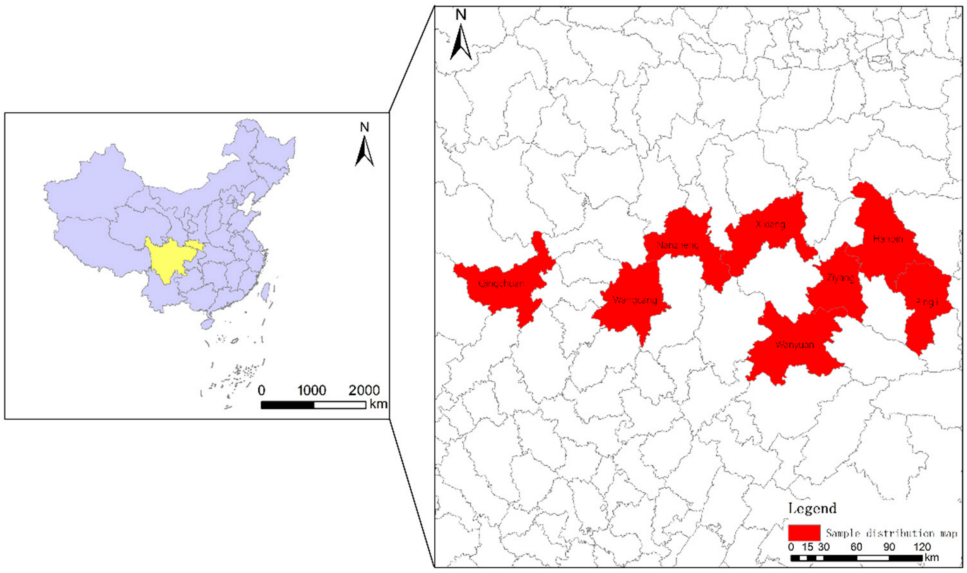

Figure 3. Sample distribution map.

3.3. Measures

3.3.1. Farmers' Perceived Stress

Farmers' perceived stress was classified into three categories in the study: the stress from uselessness perception, the stress from difficulty perception, and the stress from in-adaptation perception. The stress from uselessness perception was measured from two aspects: environment protection effect and economic interest increase according to the Weber's "dual rationality" [40]. Referring to studies of Wang [41] and Yu, the stress from difficulty perception was measured from farmers' capacity to operate the practice successfully and the resources the farmers own to continually support their adoption of the practice, such as time, money, and labor force. Polites and Karahanna divided the individuals' inertia towards a certain behavior or service into three categories: behavioral inertia, cognitive inertia, and attitudinal inertia. Inspired by this, the study measured farmers' stress from in-adaptation perception by measuring farmers' behavioral, attitudinal, and cognitive inertia towards the traditional fertilization methods. All the measures were examined using the Likert five-point method: 1 point for "awfully disagree" and 5 points for "totally agree".

3.3.2. Farmers' Continual Adoption of Farmland Quality Improvement Practice

Continual adoption of organic fertilizer instead of chemical fertilizer practice, continual adoption of soil testing and formulated fertilization practice, and continual adoption of inter-cropping green manure practice are used to measure farmers' continual adoption of farmland quality improvement practice. Each of the three kinds of fertilization practice have their own advantages in improving farmland quality in a sustainable way. When we discuss the situation of farmers' adoption of the three practices, we give 1 point for farmers' continual adoption of the practice, and 0 points for farmers' abandoning after the initial adoption of the practice. Then, referring to the previous study of Fang [42], the three results were summed and values assigned: 1 point for abandoning continually adopting all the three practices, 2 points for continually adopting one of the practices, 3 points for

continually adopting two of the practices, and 4 points for continually adopting all three practices, and finally, a four-point scale formed.

3.3.3. Farmers' Self-Efficacy

Self-efficacy is the mediating variable in the hypothesis. The study adopted the General Self-efficacy Scale (ESGS) adapted by Wang [43] from the version designed by German psychologist Schwarzer and his colleagues in 1981. The scale is a one-dimensional scale, containing 10 items. It is mainly used to measure an individual's belief that he or she can successfully adapt to changes or finish the challenges in their surroundings. The Chinese version of the scale is a four-point one: 1 point for "totally right", 4 points for "completely wrong".

3.3.4. Social Support

Social support is the moderating variable in the hypothesis. According to Estell and Purdue, the study measured social support from the three dimensions. In the measurement of emotional support and direct material support, 1 point was given for "none" and 5 points for "very large". In the measurement of individual's utilization of social support, 1 point was given for "awfully disagree" and 5 points for "totally agree". According to Wen and Wu [44], the items parceling strategy was used to parcel the three dimensions of social support into the one which is convenient for testing the moderation effect of social support.

3.3.5. Control Variables

The control variables the study selected to include in the model are age (age: in years), household farmland scale (area: in hectares), proportion of agricultural income to the total household income (income: 1 = less than 20%; 2 = 20–40%; 3 = 40–60%; 4 = 60–80%; 5 = more than 80%), and population of farmers' household (FP: in number). The four control variables are widely used in the previous studies. Many studies [45–47] point out that the age, the proportion of agricultural income in total household income, and the family population all negatively impact farmers' practice adoption. The larger the farmland scales, the more willing farmers are to adopt the new technology [48]. Table 1 shows the indicators for the latent variables.

Table 1. Indicators for the latent variables.

Latent Variables		Indicators		Mean	S.D.
Perceived stress	Stress from uselessness perception (PSU)	pu1	The quality improvement in tea is far below the expectation	2.760	0.930
		pu2	The income promotion of tea growing is far below the expectation	2.780	0.921
		pu3	The environment quality improvement is far below the expectation	2.760	0.895
	Stress from difficulty perception (PSD)	pd1	My capacity to adopt the practice is far below the expectation	2.780	1.085
		pd2	The cost of time, money, and labor force to adopt the practice is far beyond the expectation	2.670	1.214
		pd3	The practice adoption effect I get is far below the expectation compared with other farmers	2.600	1.120
	Stress from in-adaptation perception (PSI)	pi1	It is more comfortable to adopt my previous fertilization methods	2.900	0.886
		pi2	I never communicate with others on the adoption experience of the practice	2.830	0.886
		pi3	It is very hard for me to actively participate in learning the methods of the practice adoption	2.860	0.892

Table 1. *Cont.*

Latent Variables		Indicators		Mean	S.D.
Social support (SS)	Direct material support (DA)	da1	The adequacy of the information on the adoption of the practice	2.770	1.032
		da2	The convenient degree of the communication with technical experts on the adoption of the practice	2.830	1.024
		da3	The degree of the difficulty on the subsidy attainment of the practice adoption	2.870	0.955
	Emotional support (ES)	es1	The support from family for me to adopt the practice	2.670	1.116
		es2	The support from cadres for me to adopt the practice	2.740	1.215
		es3	The support from neighbors for me to adopt the practice	2.720	1.066
	Individuals' utilization of social support (AE)	ae1	I can get enough money to support my practice adoption	2.900	1.03
		ae2	I can understand and recognize the useful information for my practice adoption	2.910	1.013
		ae3	I can invite others to help me adopt the practice	2.870	1.106
Self-efficacy	Self-efficacy (SE)	se1	If I do my best, I can solve all the problems	2.810	0.563
		se2	Even if others object to me, I still have a way to get what I want	2.720	0.66
		se3	It is easy for me to adhere to the ideal and achieve the goal	2.680	0.643
		se4	I am confident that I can effectively deal with anything unexpected	2.720	0.673
		se5	With my intelligence I will be able to cope with any unexpected situation	2.720	0.657
		se6	I can solve most problems if I make the necessary effort	2.70	0.654
		se7	I can face difficulties calmly because I trust my ability	2.730	0.655
		se8	I usually find several solutions to problems	2.730	0.618
		se9	When there is trouble, I can usually think of some coping methods	2.720	0.617
		se10	I can handle whatever happens to me	2.710	0.657
Continual adoption	Continual adoption of farmland quality improvement practice (C)	C1	Continual adoption of the organic fertilizer instead of the chemical fertilizer practice	0.600	0.491
		C2	Continual adoption of the soil testing and formulated fertilizer practice	0.140	0.345
		C3	Continual adoption of the inter-cropping green manure practice	0.330	0.471
Control variables	Age		Age of farmers	56.72	10.642
	FP		Family population	3.720	1.534
	AREA		Farmers' households land use area	10.235	7.915
	Income		The proportion of agricultural income in household total income	2.240	1.245

3.4. Pre-Test

SPSS 26.0 and Amos 26.0 were used to conduct exploratory factor analysis and confirmatory factor analysis to test the reliability and validity of each latent variable scale

in the questionnaire. Then, Amos 26.0 was used to test the common method bias of the survey data.

3.4.1. Model Reliability and Validity

To test the reliability of the model scale, the values of Cronbach's α of every latent construct were computed using SPSS 26.0 software. It can be seen in Table 2 that all the computed values are greater than 0.75, higher than the lowest limit, that is 0.7, confirming the internal consistency reliability of the latent variables [49]. Additionally, the composite reliability of all latent variables is over 0.7, which further confirmed the internal consistency of the latent construct. The reliability of the model scales was appropriate further analysis.

Table 2. Reliability and validity analysis of latent variables.

Latent Variables	Observable Variables	Factor Loading	Cronbach's α	CR	AVE
PSU	pu1	0.832	0.868	0.869	0.689
	pu2	0.793			
	pu3	0.863			
PSD	pd1	0.89	0.919	0.920	0.794
	pd2	0.912			
	pd3	0.871			
PSI	pi1	0.793	0.827	0.826	0.613
	pi2	0.797			
	pi3	0.759			
SS	ae	0.878	0.762	0.772	0.536
	es	0.659			
	da	0.635			
SE	se1	0.703	0.909	0.910	0.502
	se2	0.693			
	se3	0.683			
	se4	0.758			
	se5	0.741			
	se6	0.685			
	se7	0.694			
	se8	0.692			
	se9	0.689			
	se10	0.743			

Then, the validity of the model scale was tested. The research group designed the questionnaire items based on the extensive reading of relevant literature and launched the pre-investigation to guarantee the rationality of the question design, trying to best improve the content validity of the scales. Then, the factor loading of every observable variable to their latent construct were calculated using Amos 26.0 software, and according to these loading values, the average variance extracted (AVE) was calculated. The acceptable convergent validity requires that the standardized factor loading estimates should be higher than 0.5 and statistically significant at least, so that it can guarantee the values of AVE estimates higher than 0.5, to ensure that the convergent validity of the scales is qualified. From Table 2, the estimates of factor loading were all greater than 0.6, higher than 0.5, and AVE estimates of every latent variable were over 0.5, indicating that the convergent validity of the scales was qualified. Discriminate validity was assessed by comparing the model fit results of the one-, two-, three-, and four-factor models. If the model fit results improved from the one-factor model to the four-factor model, the four-factor model discriminate validity was qualified. As shown in Table 3, the four-factor model fit results were the best of the four. Till then, the content validity, convergent validity, and discriminate validity of the model were all qualified. The validity of the model allowed the further analysis of the model.

Table 3. Test for discriminant validity.

Factor Model	χ^2	df	χ^2/df	CFI	IFI	TLI	RMSEA
One-factor: PSU + PSD + PSI + SE	1841.808	209	8.817	0.73	0.731	0.701	0.126
Two-factor: PSU + PSD + PSI, SE	1626.08	208	7.818	0.765	0.766	0.729	0.118
Three-factor: PSU + PSD, PSI, SE	940.462	206	4.565	0.879	0.879	0.864	0.085
Four-factor: PSU, PSD, PSI, SE	659.125	203	3.247	0.925	0.925	0.914	0.068

3.4.2. Common Method Bias Test

In the process of data collection, the predictor variable and the criterion variable may be influenced by the factors such as the same researcher, data collection environment, etc., causing co-variation, which would result in systematic errors unrelated to the measurement characteristics. The co-variation phenomenon of the predictor variables and criterion variables is what we call the common method bias. In order to minimize the impact of common method bias on the research results, the study adopted the method of setting reverse questions and anonymous interviews in the process of data collection and the mono-factorial confirmatory factor analysis method was used to test the common method bias of the research data. Specifically, to complete the one-factor confirmatory factor analysis with all observation variables involved in hypothesis testing, if the results of the fitting indexes in the one-factor model are obviously worse than the four-factor model, we say that the data does not have serious common method bias [50]. From Table 3, the results of the four-factor model were obviously better than the one-factor model, so that the data for the study did not have serious common method bias.

3.4.3. Model Fit

The model fit test was completed both in the total effect model and the mediation effect model before the running of the SEM in Amos 26.0 software. The results are shown in Table 4. RMSEA, the absolute adaptability index of SEM, was 0.066 for the total effect model and 0.048 for the mediation effect model. Both values were lower than 0.08, the highest limit of RMSEA's fair range. χ^2/df is usually regarded as the simplified adaptability index in SEM, and the fair range of χ^2/df is lower than 3, and sometimes the values lower than 5 are acceptable. The value of χ^2/df in the total effect model was 3.131, while the mediating effect model's was 2.139, within the fair range. The value-added adaptation index values of the total effect SEM, IFI, CFI, TLI, NFI, and RFI were 0.958, 0.946, 0.957, 0.939, and 0.927, respectively, and the mediating effect model's were 0.957, 0.95, 0.956, 0.921, and 0.911, respectively. Both models' value-added adaptation indexes were higher than 0.9, the lowest limit of the value-added adaptation indexes' fair range. Generally, both model fit test results were preferable, but the mediating effect model's was much better. The results showed that the mediating effect SEM provided a reasonably good fit, indicating that introducing the self-efficacy into the relationship between the perceived stress and continual adoption was rational.

Table 4. Total effect model and mediation effect model fit test.

	χ^2/df	RMSEA	IFI	CFI	TLI	NFI	RFI
Fair fit range	<5	<0.08	>0.9	>0.9	>0.9	>0.9	>0.9
Total effect model	3.131	0.066	0.958	0.946	0.957	0.939	0.927
Mediation effect model	2.139	0.048	0.957	0.95	0.956	0.921	0.911

4. Results and Discussion

4.1. Socio-Economic and Demographic Profile of the Respondents

The profile of the samples is presented in Table 5. Most of the decision makers of tea planting in the surveyed households have a low level of education. More than 63% of the

surveyed farmers had formal education of less than 6 years. What may closely relate to this is the fact that more than 80% of the surveyed farmers are middle-aged and elderly people, generations of people growing in the time period without the compulsory education policy in China. Additionally, the farmland scale of the surveyed farmers is generally small, more than 64% of the surveyed households owned farmland of less than 0.67 hectares, which indicates the intensive farming in the past studies. However, another fact may overthrow the indication, that is, nearly half of the surveyed farmers undertake farming only in the busy farming season, and almost 20% of the surveyed farmers do not do farming at all, they hire others to help them farm. It reflects that, nowadays, most farmers do not only rely on farming to make their living. Additionally, more than half of the surveyed households' agricultural income was less than 40% of their total income. This is another piece of evidence for the above conclusion to support the idea that agricultural production is not the main income source of many farmers' households anymore. Regarding the continual adoption of farmland quality improvement practices, farmers' continual adoption rate of the three fertilization methods differs a lot. The organic fertilizer instead of chemical fertilizer practice is the most popular, with 59.72% of farmers continually adopting, while the soil testing and formulated fertilizer practice have the lowest popularity, only 13.77%.

Table 5. Socio-economic and demographic profile of the respondents.

Category	Characteristics	Frequency	Proportion (%)	Category	Characteristics	Frequency	Proportion (%)
Continual adoption of organic fertilizer instead of chemical fertilizer practice	Abandon the continual adoption	199	40.28%	Age	18–45	65	13.16%
	Continual adoption	295	59.72%		46–60	250	50.61%
Continual adoption of soil testing and formulated fertilizer practice	Abandon the continual adoption	426	86.23%		More than 60	179	36.23%
	Continual adoption	68	13.77%	Educational attainment	Illiteracy	96	19.43%
Continual adoption of inter-cropping green manure practice	Abandon the continual adoption	331	67.00%		Less than 6 years	225	45.55%
	Continual adoption	163	33%		More than 6 years	173	35.02%
Proportion of agricultural income in total family income	Lower than 40%	343	69.43%	Farming situation	Only in busy farming season	234	47.37%
	Higher than 40%	151	30.57%		Farming all year	169	34.21%
Scale of operation	More than 0.67 hectares	174	35.22%				
	Less than 0.67 hectares	320	64.78%		Hiring others to farm	91	18.42%

Generally speaking, the surveyed farmers are characterized by low education attainment level, older ages, small-scale management of farmland, part-time farming, and inactive attitude to continually adopt the farmland quality improvement practice. These characteristics are all consistent with the current situation of agricultural production and characteristics of agricultural population in Qinba Mountain Area. Additionally, the standard deviation of most of the observable variables is smaller than 1. It indicates that the means can represent the set of the variables well. We also calculated the standard errors of the set of the variables. The results show that the standard errors of the set of variables were all less than 0.055 which indicates that the sample has great reliability. Furthermore, the samples were obtained by stratified sampling method which guarantees the randomness of the samples. Therefore, the samples are representative to some extent.

4.2. Results of the Total Effect Model

The SEM model was constructed based on the rational theoretical analysis and the results of the confirmatory factor analysis (CFA). Figure 4 shows the standardized path coefficients and factor loading estimates of the total effect SEM model with the participation of the four selected control variables.

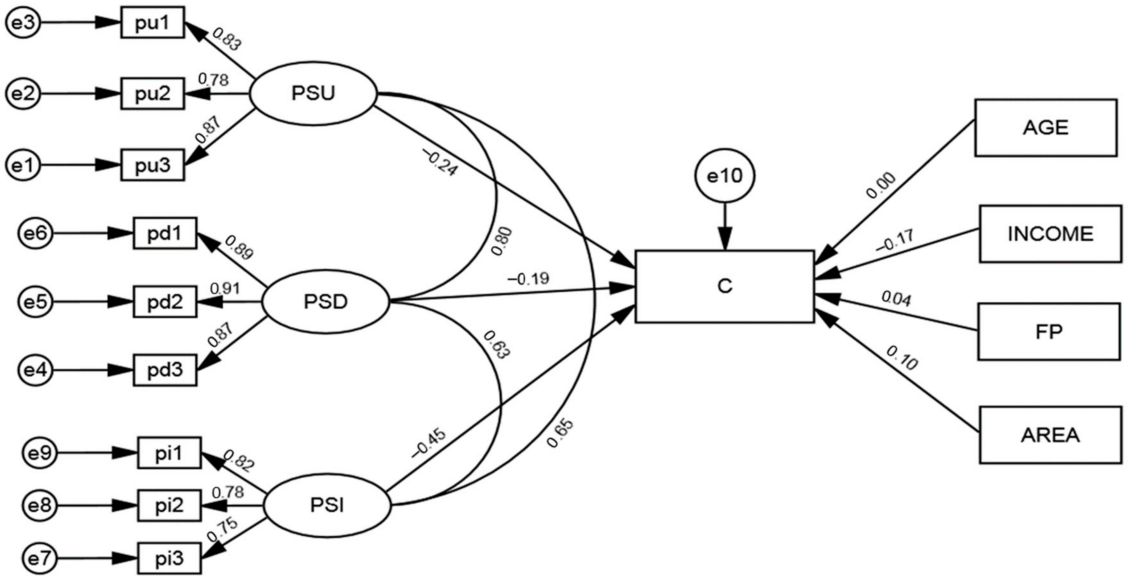

Figure 4. Total effect model.

As is shown in Figure 4, stress from uselessness perception (PSU), stress from difficulty perception (PSD), and stress from in-adaptability perception (PSI) all have a significant negative effect on farmers' continual adoption of farmland quality improvement practice (C). Intensity of perception from uselessness, difficulty, in-adaptability of the farmland improvement practice in the first adoption period can strengthen farmers' perceived stress on the continual adoption of the practice. Therefore, the stronger the intensity the perceived stress, the more likely the farmers are to abandon the continual adoption of the practice after the first adoption. More specifically, stress from uselessness perception increased by 1 unit, farmers' continual adoption of the farmland quality improvement practice decreased by 0.24 units; stress from difficulty perception increased by 1 unit, farmers' adoption of farmland quality improvement practice decreased by 0.194 units; stress from in-adaptability perception increased by 1 unit, farmers' adoption of farmland quality improvement practice decreased by 0.45. The empirical analysis results support Hypotheses 1a, 1b, and 1c. Further, the stress from in-adaptability perception (Estimate = -0.45, $p < 0.01$) had the strongest negative impact on farmers' continual adoption of the practice, the stress from uselessness perception (Estimate = -0.24, $p < 0.01$) was the second, and the stress from difficulty perception was the weakest (Estimate = -0.194, $p < 0.01$). The findings indicate that farmers' inertia to adopt the traditional method of fertilization may be the most critical factor to stop farmers from continually adopting the farmland quality improvement practice in the three, the difficulty in operation of the new technology and lacking of resources to support the continual adoption of the practice, the uselessness perception of the practice to improve agricultural income and environment quality may have negative impacts on farmers' continual adoption to some extent, but much less compared with the negative impact brought about by the stress from in-adaptability perception.

In control variables, farmland scales (Estimate = 0.102, $p < 0.01$) positively affect farmers' continual adoption of the farmland quality improvement practice. Additionally, proportion of agricultural income in household total income (Estimate = -0.170, $p < 0.01$) negatively impacts farmers' continual adoption. The above two results are consistent with the existing research findings, while impact of age and family population on farmers'

continual adoption were not significant. The possible reasons are: sample farmers are generally older, more than 86% of sample farmers are over 45 years old, so that there is no obvious discrimination among the survey data. In order to guarantee the unification of the calculation standard, only the family members on the same household register were included in when collecting the family population data. While, in reality, there are many households whose family members live and farm together, but they are on different household registers, and there is also the situation that the family members are on the same household register, but they live and work separately for various reasons. This fact may lead to the insignificance of the impact of family population on farmers' continual adoption of the practice.

4.3. Results of the Mediating Effect Model

When self-efficacy was introduced to the negative impact of perceived stress on farmers' continual adoption of the farmland quality improvement practice, the direct paths, shown in Table 6, and indirect paths, shown in Table 7, from perceived stress to self-efficacy, and from self-efficacy to continual adoption, were tested in the mediating effect SEM.

Table 6. Test of direct effects among variables in the mediation effect model.

Paths	Estimate	S.E.	CR (Critical Ratio)
PSU → C	−0.179 ***	0.070	−2.869
PSD → C	−0.172 ***	0.042	−3.021
PSI → C	−0.385 ***	0.065	−7.216
SE → C	0.188 ***	0.100	3.850
PSU → SE	−0.310 ***	0.042	−3.99
PSD → SE	−0.165 **	0.026	−2.31
PSI → SE	−0.370 ***	0.036	−6.089

Note: *** indicates 1% significance level, ** indicates 5% significance level.

Table 7. Mediating effect analysis.

Path	Effect	S.E.	Bias-Corrected 95% CI		
			Lower Bound	Higher Bound	*p*
PU → SE → C	−0.058	0.024	−0.121	−0.024	0.001
PE → SE → C	−0.031	0.017	−0.079	−0.006	0.01
PF → SE → C	−0.07	0.024	−0.127	−0.03	0.002

As is shown in Table 6, the negative impact of perceived stress on farmers' continual adoption of the farmland quality improvement practice was significant after the introduction of self-efficacy into the relationship. Still, stress from in-adaptability perception (Estimates = −0.385, $p < 0.01$) had the strongest negative impact on the continual adoption, stress from uselessness perception (Estimates = −0.179, $p < 0.01$) is the second, and stress from difficulty perception (Estimates = −0.172, $p < 0.01$) is the third.

Stress from in-adaptability perception (Estimates = −0.370, $p < 0.01$), stress from difficulty perception (Estimates = −0.165, $p < 0.05$), and stress from uselessness perception (Estimates = −0.310, $p < 0.01$) all possessed a negative effect on the level of farmers' self-efficacy to continually adopt the farmland quality improvement practice. The stronger the farmers' perceived stress, the lower the level of farmers' self-efficacy on continually adopting the practice. Additionally, stress from difficulty perception had the weakest negative impact on farmers' self-efficacy, while the negative impact of stress from uselessness perception and in-adaptability perception on farmers' self-efficacy were very close to each other. The rational reasons for the situation may be as the following: Firstly, it has been conventional for Chinese farmers to fertilize in accordance with their individual agricultural production experience. The survey found that farmers generally believe that the chemical fertilizer is much more convenient and time saving. The transformation from the

conventional and convenient fertilization mode to another farmland quality improvement fertilization practice must be a great challenge for farmers. It is natural that farmers tend to continue adopting and in favor of their traditional fertilization way no matter to their behavior, cognition, or attitude. The strong inertia intensifies the stress from in-adaptability perception of farmers on the continual adoption of the farmland quality improvement practice. Therefore, the greater the stress from in-adaptability perception, the lower the ability of farmers to control their continual adoption behavior, that is, their self-efficacy in continual adoption of the farmland quality improvement practice. On the other hand, the surveyed farmers have rich experience in agricultural production, so that it might be easier for them to understand the operation steps of farmland quality improvement practices. Additionally, due to the small scales of the farmland, the financial stress of the practice adoption is not that large. Then, farmers' stress from difficulty perception is much smaller compared with the other two.

Self-efficacy (Estimates = 0.188, $p < 0.01$) positively affects farmers' continual adoption of the practice. Farmers' self-efficacy increased by 1 unit and their adoption of the farmland quality improvement practice increased by 0.188 units. The results indicated that self-efficacy prompted farmers' continual adoption of the farmland quality improvement practice. The farmers with stronger self-efficacy were more likely to continually adopt the farmland quality improvement practice, therefore, taking measures to improve the level of farmers' self-efficacy on continual adoption of the practice helps promote farmers' farmland quality improvement practice ratio.

The Bootstrap method was used to repeatedly extract data samples 5000 times for mediating effect analysis. Referring to the non-parametric percentile Bootstrap method of deviation correction by Fang Jie and Wen Zhonglin, the mediating effect test was carried out. If the calculated effect value does not include 0 in the 95% confidence interval, the mediating effect is significant [51]. The mediating effect of self-efficacy in the study is shown in Table 7.

From Tables 6 and 7, stress from uselessness perception, stress from difficulty perception, and stress from in-adaptability perception significantly lower farmers' self-efficacy to continually adopt the farmland quality improvement practice while self-efficacy significantly prompts farmers' continual adoption of the practice. The mediating effect of self-efficacy on the relationship between stress from uselessness perception and continual adoption of the practice, stress from difficulty perception and continual adoption of the practice, stress from in-adaptability perception and continual adoption of the practice are -0.058, -0.031, and -0.07 respectively. Additionally, there is no 0 between the lower bound and the higher bound in the 95% confidence interval, self-efficacy significantly mediated the negative impact of perceived stress on the continual adoption of the practice. The empirical analysis results support Hypotheses 2a, 2b, and 2c. In all, stress from uselessness perception, stress from difficulty perception, and stress from in-adaptability perception lower farmers' self-efficacy, leading to farmers' low conviction in completing tasks with high expectation successfully and less ability to control themselves to complete the tasks continually, finally leading to the abandonment of the continual adoption of the farmland quality improvement practices.

4.4. Results of the Moderating Effect

SPSS 26.0 extended macro PROCESS 3.3 compiled by Hayes was used to further analyze the moderating effect of social support on the relationship between stress from uselessness perception and continual adoption of the practice, stress from difficulty perception and continual adoption of the practice, stress from in-adaptability perception and continual adoption of the practice, respectively. The moderating effect test results are shown in Table 8.

Table 8. The moderating effect of social support.

Variables	PU → C		PE → C		PF → C	
	Effect	**S.E.**	**Effect**	**S.E.**	**Effect**	**S.E.**
Constant	2.179 ***	0.207	2.033 ***	0.172	2.267 ***	0.171
PU	−0.570 ***	0.035				
PE			−0.458 ***	0.028		
PF					−0.643	0.039
SS	0.092 ***	0.034	0.080 **	0.034	0.028	0.034
PU × SS	0.085 **	0.041				
PE × SS			0.085 ***	0.030		
PF × SS					0.056	0.044
Age	0.011	0.003	0.001	0.003	−0.0001	0.003
Income	−0.181 ***	0.023	−0.145 ***	0.024	−0.178 ***	0.023
Area	0.017 ***	0.003	0.019 ***	0.003	0.012 ***	0.003
FP	0.015	0.017	0.027	0.017	0.022	0.017
R^2	0.543		0.547		0.549	
F	82.538		83.78		84.646	

Note: *** indicates 1% significance level, ** indicate 5% significance level.

It can be seen from Table 8 that the path coefficient of the interaction between stress from uselessness perception and continual adoption of the practice was significant (estimate = 0.085, $p < 0.01$). Social support had a positive moderating effect on farmers' continual adoption of the farmland quality improvement practice. Specifically, social support can effectively alleviate the negative inhibitory effect of perceived stress on farmers' continual adoption of the practice. The empirical analysis supports Hypothesis 3a. Additionally, the same as stress from uselessness perception, the negative effect of stress from difficulty perception (estimate = 0.085, $p < 0.05$) on farmers' continual adoption of the practice can also be buffered by social support. The empirical analysis supports Hypothesis 3b. The path coefficient of the interaction between stress from in-adaptability perception and continual adoption of the farmland quality improvement practice was insignificant. The moderation effect of social support could not work in the relationship. Therefore, the empirical analysis results do not support Hypothesis 3c. The social support cannot help to buffer the negative impact of stress from in-adaptability perception on continual adoption of the practice.

5. Discussion

5.1. The Relationship between Perceived Stress and Farmers' Continual Adoption of Farmland Quality Improvement Practices

Exploring the relationship between perceived stress and continual adoption of farmland quality improvement practices could help explain the general findings in field surveys that some farmland quality improvement practices with good economic and ecological benefits have not been continually adopted.

One of the typical individual behavioral responses to perceived stress is passive avoidance. The resources loss stimulates an individual's perception of stress, and individuals tend to abandon the continual behavior in order to keep the limited existing resources he or she owns. Stress from uselessness perception comes from farmers' negative perception of the economic incomes and environment interests of farmland quality improvement practice adoption. The unbalanced comparison results of before-and-after adoption profits activate farmers' perception of resources loss; they tend to believe that the adoption of the practice is useless, even "not worth the candle", which then stimulates their stress from uselessness perception, and stops their continual adoption of the practice. Identically, the unexpectable

difficulties farmers meet within the process of their practice adoption, such as the lack of time, money, labor, etc., and operation problems, would make farmers think that the adoption of the practice is "beyond their power" and they need to invest much more to maintain the continual adoption, that is, perceiving the threat of resource loss, which would stimulate the perception of stress from the difficulty perception and make farmers avoid the continual adoption of the practice. Moreover, the changes in the production modes would bring about the uncomfortable feeling that comes from farmers' hard conquering of old habits forming across a long period and trying best to adapt to the new modes of fertilization. Chinese farmers' extensive use of chemical fertilizers has been a convention. "Old habits die hard". The in-adaptability feeling from their behavior, cognition, and attitude towards the new fertilization methods would cause resource loss both mentally and materially, which could stimulate the perception of stress from in-adaptability perception and finally cause the abandoning of farmland quality improvement practices. The above analyses were all consonant with the SEM test results that perceived stress had a negative impact on farmers' continual adoption of the farmland quality improvement practice.

The empirical analysis showed that stress from in-adaptation had the strongest negative effects on farmers' continual adoption of the farmland quality improvement practice, while the stress from difficulty perception had the weakest. It can be seen that farmers' inertia on traditional fertilization in cognition, attitude, and behavior is the key point to hinder farmers' continual adoption of farmland quality improvement practices, which also confirms the view that farmers' traditional fertilization modes are "old habits" which die hard. Stress from uselessness perception leads farmers to abandon the continual adoption of the farmland quality improvement practice, which is consistent with the argument of the Conservation of Resources Theory that resource loss is accompanied by stress response, leading to individual action to avoid resource loss. The results that stress from difficulty perception has the smallest inhibitory effect on farmers' adoption of the practice indicates that farmers were willing to learn and practice the farmland quality improvement technology; the difficulties in obtainment and operation of farmland quality improvement were not the main obstacles to farmers participating in continual adoption of farmland quality improvement practices.

5.2. Mediation of Self-Efficacy

The results of the mediation SEM model revealed that three kinds of perceived stress from different stimulations all had negative effects on farmers' self-efficacy to successfully and continually adopt the practice while the self-efficacy prompted farmers' continual adoption of the farmland quality improvement. The mediation model further confirmed individual stress response process described in the Conservation of Resources Theory that when an individual encounters stress, he or she, on the one hand, would stop the present action to preserve existing resources; on the other hand, they would actively utilize his or her psychological resources to cope, in order to maintain the present action. The individuals' stress response indicates that self-efficacy imposes a partial mediation effect on the relationship between perceived stress and farmers' continual adoption of farmland quality improvement practices. Perceived stress could cause farmers to have less capacity to control their continual behavior, that is, directly undermining individuals' self-efficacy, and then farmers who had less capacity to keep their continual behaviors would be less likely to adopt the farmland quality improvement practice. It could be seen in the process that perceived stress could influence farmers' continual adoption behavior through lowering farmers' self-efficacy. The findings on the mediating effect of self-efficacy reinforces the importance of psychological resources in confronting stress stimulated by external environmental elements. Experts are all trying to determine and improve the external conditions to facilitate farmers' continual adoption of farmland quality improvement but ignoring the fact that the internal psychological resources could also directly influence individuals' behaviors. The fact that individual's internal power is as important as external conditions should be taken into account. Moreover, internal elements

should not be put on an auxiliary and side position, but the subjective position as the external position.

5.3. Moderation of Social Support

Social support, as a kind of supplementary resource, could buffer the negative effect of perceived stress on individuals' behavior according to the Job Demand–Resource Theory. The findings of the study on the moderation effect of social support confirmed the "action logic" proved again and again by existing studies that the direct support from government and farmers' active response are the two impartible parts to collectively promote farmers' continual adoption of farmland quality improvement practices in the micro aspects. Moreover, direct support and utilization of social support can effectively alleviate the inhibitory effects of stress from uselessness perception and difficulty perception on continual adoption of the practice. It suggests that the government should pay attention to farmers' utilization of social support, qualitatively and quantitatively, strengthening the coordination between social support and farmers' ability to utilize social support. There is also a widespread assumption that emotional support from family members, neighbors, and cadres could help alleviate individual's perceived stress. However, the study found that the positive moderation effect of social support could not work in the relationship between stress from in-adaptability perception and continual adoption of farmland quality improvement. The reasons for the results may be the following: stress from in-adaptability perception caused by changes in traditional production modes, emphasizing individuals' attachments of the old modes in behavior, attitude, and cognition. Polite called the individual attachments "inertia", that is hard to control, only waiting for individual's acceptance of the new modes and gradual accumulation of a new inertia. In light of the findings, it can be clearly seen that technology or practice popularization would be a long-term process, we must be prepared for the "protracted war" of farmland quality improvement practice popularization

6. Conclusions, Policy Implications, and Limitations

Based on Expectation Confirmation Theory and Conservation of Resources Theory, the study classified farmers' perceived stress on continual adoption of farmland quality improvement practices into three categories: stress from uselessness perception, stress from difficulty perception, and stress from in-adaptability perception. In addition, the study introduced self-efficacy and social support to explore the direct effects of perceived stress on farmers' continual adoption of the practice and analyze the functional mechanism of the three obstructive categories. Finally, the following conclusions were drawn:

Stress from uselessness perception, stress from difficulty perception, and stress from in-adaptability perception inhibit farmers' continual adoption of farmland quality improvement practices through lowering farmers' self-efficacy on the continual adoption of the practice. Additionally, the stress from in-adaptability perception has the strongest inhibitory effect both on farmers' self-efficacy and farmers' continual adoption of the practice while the stress from uselessness perception has the weakest effect. Furthermore, the higher the level of social support, the weaker the negative effect of stress from uselessness perception and stress from difficulty perception on farmers' continual adoption of farmland quality improvement practices specifically. However, social support cannot buffer the negative effect of stress from in-adaptability perception on farmers' continual adoption of farmland quality improvement practices.

In light of the findings, we put forward the following suggestions on farmland quality improvement practice popularization among smallholder farmers and hope the suggestions could be taken into account during the enacting of government promotion policy of farmland quality improvement practices.

Firstly, the agricultural technology extension center should take full account of and differentiate the stress farmers perceived in different stages of technology adoption, training and guiding farmers with great stress on the adoption of the practice with pertinence, actively remedying and rectifying farmers' negative cognition on farmland quality improve-

ment practice due to the "resources loss", strengthening farmers' identity on continual adoption of farmland quality improvement practice, so as to promote farmers' continual adoption of farmland quality improvement practices. Secondly, the agricultural technology extension center should provide farmers with timely communication opportunities with technical personnel, especially after farmers' first adoption of the practice which is the critical decision-making stage for farmers to determine whether to continue the adoption or not. Taking more incentive policies, enhancing farmers' self-efficacy, so as to reduce the possibility of farmers' abandonment on continual adoption of farmland quality improvement practices due to perception of stress from uselessness, difficulty, and in-adaptability after the first adoption. Thirdly, the agricultural technology extension center should set up technology promoters in specific villages, carrying out the "point-to-point" work, taking responsibility for the farmland improvement practice adoption for a certain group of farmers in the specific areas, participating in farmers' groups in depth, to provide farmers with the two-dimensional support from both the technical and emotional aspects. In the meantime, help to improve farmers' ability to utilize social support efficiently, preparing for the long-term struggle on farmland quality improvement practice promotion.

Based on the survey data, the study explored the impact of perceived stress on farmers' continual adoption of farmland quality improvement practices and its mechanism and obtained some useful conclusions and policy implications. However, there are still some limitations that need further improvement in future research. The limitations were mainly displayed in two aspects:

Firstly, the study should increase the acquisition of data from farmers that produce different types of agricultural products, to explore the impact of farmers' perceived pressure on their farmland quality improvement practice. Different types of crops have different demand for the amount of fertilizer, which will directly affect farmers' usefulness perception, difficulty perception, and inadaptability perception of farmland quality improvement practice, and ultimately affect the intensity of perceived stress on their continual adoption. Due to the limitation of energy and time, this study failed to obtain more data from farmers planting different types of crops, and only focused on the tea farmers. In the follow-up study, more data from different types of farmers should be selected to enhance the universality and practicability of the research conclusion.

This study should keep the dynamic tracking of farmers' adoption of farmland quality improvement practices, not only to consider the perceived stress of farmers before the continual adoption of the practice, but also to explore the perceived stress of farmers before the initial adoption of the practice, which will help to comprehensively understand the complete mechanism process of farmers' adoption of farmland quality improvement practice. The paper only focused on farmers' continual adoption stage, which is not comprehensive enough.

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Institutional Review Board Statement: Ethical review and approval were waived for this study due to the following reasons: all subjects gave their informed consent for inclusion before they participated in the study. The study was conducted in accordance with the Declaration of Helsinki. According to institutional guidelines and national laws and regulations, no ethical review is required, because there is no unethical behavior in this study. After the verbal consent of the sample farmers, all the questionnaires were filled in by sample farmers themselves, and the application for ethics review exemption has been approved.

Informed Consent Statement: Waiver of Documentation Requirement of Informed Consent Request was approved.

Data Availability Statement: The data supporting reported results can be provided upon request to the interested individuals/researchers. The data presented in this study are available on request from the corresponding author.

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

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