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Sustainable Forest Development in the Digital Era: The Impact of Internet Use on the Happiness of Forest Farmers' Families in Ecologically Fragile Ethnic Areas of China

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Abstract: In the policy arena of the rapid development of China's digital village, understanding how internet use enhances the happiness of forest farmers' families holds theoretical and practical significance for promoting the protection of the ecological environment and the sustainable development of forests. This study utilizes survey data from 2023 on forest farmers in ecologically fragile ethnic areas in China. Based on sustainability, a five-dimensional evaluation index system for the happiness of forest farmers' families has been constructed. First, the CRITIC-TOPSIS model is employed to calculate the happiness scores of forest farming households. Subsequently, the Tobit model and the mediation effect model are applied to examine and analyze the influencing factors and mechanisms of internet usage on the happiness of forest farmers' families. The study finds that, first, an increase of one unit in terms of internet use is associated with a 0.031-unit increase in the happiness of forest farmers' families, and that education, social perception, and policy perception all have a positive effect on the happiness of forest farmers' families. Second, the mechanism of action suggests that internet use significantly increases forest farmers' families' happiness through subjective class identity. Third, further heterogeneity analyses revealed that internet use contributed to the happiness of forest farmers' families in the male group, the low human capital group, and the group with an ecological forest ranger in the family. Therefore, it is necessary to strengthen the construction of digital rural infrastructure and develop new models such as digital forestry; cultivate and introduce specialized digital talents in rural areas and enhance the digital literacy of forestry farmers; and assist forestry farmers in establishing class identity concepts and social values conducive to the sustainable development of forests and implement ecological values in production practices, thereby improving the happiness of forest farmers' families.

Keywords: digital village; forest farmers; subjective class identity; happiness; CRITIC-TOPSIS model

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1. Introduction

Happiness is not only a life goal pursued by everyone but also an important measure for assessing a country's ecological sustainability and the happiness of its society [1]. From a sustainable perspective, the human pursuit of happiness may involve the utilization of unsustainable institutional arrangements or economic policies to achieve it [2], leading to the waste of natural resources and a certain trend of environmental degradation. Thus, the generation and elevation of happiness require joint actions at both individual and national levels within a sustainable framework to achieve sustainable happiness. Simultaneously, the widespread diffusion of internet technology has brought about profound transformations in human society and information sharing. A plethora of environmental knowledge and ecological awareness, influenced by the information explosion, is impacting human environmental sustainability consciousness [3,4]. This has also emerged as a crucial factor in enhancing happiness. Nevertheless, numerous forest farmers in developing countries still find themselves in a state of relative poverty. Exploring how these forest farmers

can capitalize on the information dividends brought by internet technology within a sustainable management framework, thereby getting rid of relative poverty, fostering a business consciousness for sustainable forest development, and enhancing the happiness of forest farmers' families is a research topic with practical implications.

China's ecologically fragile ethnic areas encompass various types of ecologically fragile terrains, such as the northern wind and sand areas, the Qinghai–Tibetan plateau's cold and high-altitude areas, arid desert areas, Loess Plateau areas, and karst areas. The ecosystem structure is complex and diverse, with poor stability; it is relatively sensitive to environmental and biological factors and has weak ecological resilience, making it a typical ecological priority protection and governance area in China. As a representative of China's past deep poverty and concentrated contiguous extreme poverty, this region is a key area in urgent need of research in the transition from absolute poverty to relative poverty. The areas include 7 out of China's 14 concentrated contiguous and deeply impoverished areas, contributing 50% to China's overall poverty alleviation in 2020. As one of the representative areas of the vast global ecologically fragile ethnic areas, this area not only faces fragile ecological environmental issues but has also attempted to achieve economic growth through the path of protecting the environment and sustainable forestry. Therefore, studying the impact of internet use on the happiness of forest farmers' families in China's ecologically fragile ethnic areas not only helps forest farmers in developing countries to maximize the information dividends under a sustainable management framework and overcome the challenges brought by poverty but also holds significant importance for promoting the global sustainable development of forests in the digital age, facilitating the effective management and protection of global forest resources to address global challenges such as climate change and biodiversity loss. Consequently, in-depth research on this topic contributes to addressing current challenges in forest management and promoting the realization of sustainable development goals globally.

Previous research on happiness has primarily focused on the definition of happiness and its influencing factors, as well as the existing effects and the measurement methods of happiness. The concept of happiness can be seen as an interdisciplinary integration of philosophy, psychology, economics, ecology, and more. It encompasses judgments about current conditions and expectations for future development, based on living conditions and individual standards within the context of sustainable development. From the perspective of influencing factors, some scholars believe that the role of China's high-speed growth economy in promoting national happiness is gradually weakening [5]. It is necessary to analyze the influencing factors of happiness from other possible perspectives. The "Easterlin paradox" suggests that there is a positive correlation between income and happiness, but happiness does not rise in tandem with income [6]. The proposition of this theory provides scholars with new inspiration for research on happiness, namely, that there is a certain degree of positive correlation between the income of urban residents in China and their sense of happiness, and that the level of affluence will also affect the relationship between the two [7]. Further research has found that equal opportunities, interpersonal trust, and relative deprivation play significant mediating roles in the influence of income inequality on happiness, with factors such as gender, age, and income exerting significant moderating effects [8]. At the same time, solely emphasizing the impact of economic factors on happiness while neglecting sustainable development could lead to excessive emissions of greenhouse gases like SO_2 and CO_2, negatively affecting happiness [9,10] and further degrading the ecological environment. As the living standards of rural residents in China improve, the study of factors influencing farmers' happiness has become diversified. In addition to economic factors, the influence of some non-economic factors on farmers' happiness cannot be ignored. Scholars have proposed that non-economic factors such as social insurance [11], non-farming employment [12], industrial ecology [13], fairness and efficiency [14], labor migration [15], and environmental satisfaction [16] have a significant impact on farmers' happiness. In terms of the happiness effect, there is also previous research that demonstrates conclusions regarding the high impact of happiness on

increasing per capita household consumption [17], promoting individual employment [18], and strengthening environmental protection policies [19]. In measuring happiness, Conchita et al. explained the relationship between money and happiness based on the 11-point responses of German respondents regarding their happiness [20]. Others have employed a Likert scale to assess five levels of happiness, measuring the happiness of Chinese women in their lives [21]. Considering the comprehensive assessment of happiness, some scholars have attempted to use the flourishing scale, the satisfaction with life scale, and three new open-ended questions for a holistic measurement of happiness [22]. The existing literature has conducted in-depth analyses on aspects such as the definition, influencing factors, and measurement methods of happiness. However, there has as yet been insufficient research on the factors influencing happiness in the context of sustainability. Additionally, the measurement of happiness primarily relies on simple happiness questionnaires and subjective responses from respondents, which cannot comprehensively and accurately capture the multidimensionality and complexity of happiness.

At the same time, China's digital construction is developing rapidly, and building a digital China has also become an important engine for promoting Chinese-style modernization in the new era. In 2023, China's internet penetration rate reached 76.4%, with rural areas surpassing a 60% internet penetration rate. The number of rural internet users reached 301 million, and the proportion of administrative villages with broadband and 4G coverage reached 100%. Rural online retail sales amounted to CNY 24.9 trillion. In the context of an era when the internet has fully penetrated rural areas, internet use has become an indispensable factor affecting rural residents' sense of happiness [23]. On the one hand, some scholars believe that both productive and recreational use of the internet can enhance the happiness of rural residents [24]. The subjective happiness of elderly individuals also significantly improves during the internet usage process [25], and the internet can have a positive impact on the economic happiness of Chinese farmers [26]. On the other hand, the use and perception of the internet can enhance rural residents' trust in grassroots government, thereby increasing family happiness [27]. The information welfare effects generated are more significant for rural areas [28]. Although existing studies have extensively studied the impact of the internet on the happiness of rural households, the research perspective is limited to the broader farming population. There is a lack of in-depth exploration within the framework of sustainable forest development, examining the relationship, mechanisms, and heterogeneity analysis of internet use and the happiness of forest farmers' families.

Thus, through literature searches, it is evident that a lot of analyses and research have been carried out by academics on the connotation of happiness, influencing factors, the impact of internet use on happiness, etc. However, there may exist two shortcomings: firstly, the existing literature mostly focuses on a macro perspective, with few studies conducted on a specific region or a single micro group. Therefore, in the digital era of sustainable forest development, it is urgent to address the influencing factors, pathways, and directions for sustainable development regarding the impact of the internet on the happiness of forest farmers' families in ecologically fragile ethnic areas in China. Secondly, previous studies have often used single-variable methods to score the happiness of rural household residents, which are prone to significant measurement errors due to factors such as fluctuations in the respondents' emotions. Additionally, the existing literature mainly focuses on individuals, so it is necessary to conduct an in-depth exploration of the multidimensionality, realism, and sustainability of happiness in forest farmers' families. It entails constructing a measurement system for the happiness of forest farmers' families that aligns with the concept of sustainable development.

Therefore, this study starts with ecologically fragile ethnic areas in China as the research background, specifically relying on research data from the key countries of ecological assistance in the Qiangui Lin area of China in 2023. It first explores the impact of internet usage on the happiness of forest farmers' families in ecologically fragile ethnic areas, outlining the relationship pathway between internet usage and the happiness of forest farmers'

families. This focus provides a new perspective for studying forest farmers' families in remote ecological poverty reduction areas in China. Then, based on the sustainable concept, the happiness of forest farmers' families is divided into five dimensions, providing a more detailed and comprehensive depiction, and the CRITIC-TOPSIS model is employed for its objective measurement. Subsequently, subjective poverty and economic development perception are included as mediating variables for subjective class identity in the mechanism analysis process. This approach will deepen our understanding of how internet use affects the happiness of forest farmers' families, and it will provide new empirical evidence on the policy effects of internet use in the interplay between natural resource recycling and the sustainability of the ecological environment. Finally, based on an analysis of the heterogeneity of forest farmers in terms of gender, age, and whether there is an ecological forest ranger in the family, the differences in family happiness between different types of forest farmer groups are discussed to provide theoretical support for analyzing the relationship between the impact of internet use on family happiness among different types of forest farmers. It will also provide theoretical support for understanding and analyzing the differences in the relationship between internet usage and family happiness among different types of forest farmer groups and offer guidance and recommendations for the sustainable operation of forest farming and the decision-making of forest farmers.

2. Theoretical Analysis

2.1. Internet Use and Forest Farmers' Family Happiness

Since the implementation of the digital village strategy, the construction of digital villages across China has been developing rapidly, with a huge impact on rural infrastructure construction, agricultural informatization, and other aspects, promoting the digital transformation and modernization of rural areas. According to the social support theory, the internet can provide necessary market information and livelihood resources for forest farmers, enabling them to access knowledge and technology related to forest conservation. This support helps them adopt more sustainable forestry management practices, improve forest land management, and increase economic income while protecting the ecological environment, thereby enhancing their living standards and happiness. From the perspective of the technological diffusion theory, with the widespread application and deepening penetration of digital technologies, more and more rural families are able to use the internet proficiently and continue to improve their digital literacy, narrowing the "gap" between urban and rural digital information asymmetry. On the one hand, some scholars believe that the improvement of residents' digital literacy has enabled them to acquire more digital skills, which has a far-reaching impact on their lives and happiness and, thus, affects their sense of happiness [29]. At the same time, the popularization of the internet has led to profound changes in the patterns of production in rural society and the income structure of the peasant class, which has had an impact on the lives and emotions of peasant families and, ultimately, on their sense of happiness [30]. On the other hand, the effect of the internet on the sense of happiness can be carried out through the use of the internet for information acquisition, leisure and entertainment, and other activities, which contributes to a significant increase in the sense of happiness of the population [31]. Internet use has a significant effect on the happiness of different types of residents, such as male users, early learners, those at the secondary education level, and those in rural areas [32]. Furthermore, the popularization and application of the internet help to improve rural residents' sense of self-worth [33], satisfaction, and fairness [34], thus improving their sense of happiness. In addition, rural residents can obtain more employment opportunities through the use of the internet and improve their income level, thus increasing their sense of happiness [35].

It is worth noting that internet use may also have a dampening effect on happiness. The use of digital technology can reduce people's trust in others through social networks, thus affecting their life satisfaction [36]. Moreover, there are some risks associated with internet use. Frequent use of the internet may increase people's sense of loneliness and anxiety [37], increase bad moods [38], and may also increase the chances of family con-

flicts [39]. However, the above studies suggest that internet use by farmers may have more of an enhancing effect than an inhibiting effect on the happiness of the farmers' families.

2.2. Mechanistic Analysis of Subjective Class Identity on the Happiness of Forest Farmers' Families

Subjective class identity is an analysis of how individuals perceive their position in the class structure or social class. Class identity has a significant positive effect on the level of individual happiness [40], and subjective class identity is more closely related to the individual's self-appraisal of happiness than an objective evaluation of the individual's class status [41]. The subjective class identity of existing farmers is mainly based on their current economic status and future expectations, and their self-satisfaction judgments are formed after comparison with their neighbors. It can be seen that there is a happiness effect on the class identity of farmers, whereby the higher the happiness is of farmers, the higher the class identity of farmers [42]; conversely, if the class identity of farmers is lower than that of others, a sense of relative deprivation will be generated, which will reduce the level of happiness of farmers.

The emergence of internet technology, through its rapid dissemination of information and equal discourse space, has broken the relatively traditional and closed social structure and inherent class barriers in rural areas, and the constructed network platform has empowered different types of farmers to express their opinions and communicate with each other, influencing the class structure of rural society and speeding up the reshaping of the self-identity of farmers and their self-criticism of their own class identity. On the one hand, the information transfer of the internet enhances social connections, helps farmers break through the physical limitations of time and space, reduces the cost of social interaction and time wastage, and expands their social networks; their access to digital information technology not only enables farmers to generate more economic income [43,44] and accumulate livelihood capital but also enables individuals to make wider individual comparisons and class imaginations in cyberspace, thus realizing an improvement in the sense of happiness of farmers. On the other hand, the digital information technology of the internet provides farmers with the ability to obtain information and, at the same time, it also establishes a public participation and supervision channel for the introduction and implementation of policies. The continuous improvement of social systems, the introduction and implementation of poverty alleviation policies, and a rapid improvement in economic level have been transmitted through the internet to the cognition of farmers, which has continuously reconstructed the values of the farmers themselves. Through the use of the Internet, farmers can deeply feel these changes in society and will then have a more profound and intuitive perception of society, that is, that the development of society and the construction of the security system are intended to ensure the basic happiness of farmers [45], which further lays a cognitive foundation for an enhanced sense of happiness in farmers' families and creates an enhancement effect.

In summary, this study proposes two research hypotheses:

H1. *Internet use contributes to the happiness of forest farmers' families.*

H2. *Internet use can lead to self-worth remodeling through subjective class identity perception and enhance the happiness of forest farmers' families.*

3. Materials and Methods

3.1. Data Sources

The data used in this study were derived from field research conducted by the group from May to July 2023 in 16 townships (streets) and 32 villages in Longsheng, Luocheng, Libo, and Dushan, the key counties of ecological support in the Qiangui forest area of China. The four counties are located in the southwestern rocky desertification region of China, which is characterized by a scarcity of per capita arable land, lagging industrial development, and a high forest coverage rate. This area represents the region in China

with the highest number of impoverished people, the deepest level of poverty, and the most significant tasks in ecological restoration and governance in the past. In the past few years, the four counties have strongly relied on the forestry economy and policies. With the assistance of information technology and the digital economy, they have formed three typical forestry ecological poverty reduction models: forestry ecological industry poverty reduction, ecological public welfare position poverty reduction, and forestry ecological compensation poverty reduction. This provides a representative region for an in-depth study of how internet use, in the context of ecological poverty reduction, can enhance the sustainable happiness of forest farmers, thereby promoting the ongoing protection of the ecosystem and the recycling of resources.

To ensure data reliability, researchers conducted a preliminary survey before the official investigation, conducting individual interviews of approximately 1 h with randomly selected forest farmers in the sampled areas. The purpose was to identify any omissions or improper wording in the questionnaire, as well as other potential issues. In the formal survey, the research adopted a random stratified sampling method to ensure that the survey object covered forest farmers with different economic conditions and different livelihood modes; the research group randomly selected 2 townships (streets) in each county, then randomly selected 2–3 villages in each township (street), and finally randomly selected 10–12 forest farmers' families in each village. The research method involved going from door to door and conducting face-to-face interviews with household heads, covering basic information about the forest farmers' families, their capital ownership and perception, policy implementation, and subjective perceptions. A total of 330 questionnaires were collected for the research. After later screening and removing questionnaires with significant data missing and inconsistencies, 326 valid questionnaires were obtained, with an effective rate of 98.79%.

3.2. Variable Selection and Descriptive Statistics

(1) Explained variables. The explanatory variable of this study is the happiness of forest farmers' families. From the cognitive aspect, happiness can be viewed as an individual's overall evaluation of the quality of life based on his or her criteria [46], i.e., the sense of happiness in life; from the emotional aspect, the self-evaluation of happiness is often expressed in emotionally charged terms, which is manifested as an individual's expression of the sense of happiness in life [47]. Existing measures of happiness mainly adopt univariate scoring measures of individual or family life satisfaction, but since happiness is difficult to directly observe, scoring measures are also susceptible to the influence of actual interview bias and respondents' emotional changes, resulting in distorted results of happiness and leading to measurement bias. Therefore, in light of the happiness measurement methods and research definitions of Xing [7], Tan et al. [48], and Zhang et al. [49], and based on the availability of research data and the sustainability of forest resource utilization, this study deconstructs the happiness of forest farmers' families into five dimensions: family environment, economic status, educational conditions, public services, and developmental resilience. Among them, family environment measures the basic living conditions and water security of forest farmers' families; economic condition evaluates the subjective feeling of forest farmers regarding family income and local socio-economic development; educational condition measures the perception of social education and the degree of education of forest farmers' families; public services targets the subjective perception of forest farmers regarding local social recreation, employment, and basic public service security; and developmental resilience embodies the forest farmers' families in terms of natural disasters, epidemic shocks, and the prevention of returning to poverty (Table 1).

Table 1. Indicator system for evaluating the happiness of forest farmers' families.

Variable Name	Evaluation Dimension	Evaluation Definition	Average Value	Standard Deviation
Happiness of forest farmers' families	Family Environment	Whether the front door is connected to a hardened road	0.985	0.123
		Type of house	4.153	0.878
		Whether or not the basic family water supply is guaranteed throughout the year	0.976	0.155
	Economic situation	Do you think that the general level of economic development in the area is increasing?	3.58	0.851
		Do you think the topography of the area is favorable for economic and social development?	3.614	0.893
		Do you think that your family's income is currently higher than your expenses?	2.926	1.140
	Educational conditions	Whether the local education conditions are considered better than in many other regions	3.506	0.887
		Have family members participated in skills training?	0.785	0.44
		Whether family members have participated in forestry and grassland-related training	0.712	0.454
	Public services	Do you think that the local cultural atmosphere is very good, with many cultural activities such as songs, dances, and community associations?	3.282	1.055
		Do you think local development provides many job opportunities (labor opportunities)?	3.331	1.008
		Do you think that your basic living needs (medical care, education, and purchasing goods) are guaranteed?	3.982	0.776
	Developmental Resilience	Has the family suffered any disaster in the last two years?	0.675	0.799
		To what extent has the COVID-19 pandemic affected your family's agricultural (forestry) production or migrant labor?	2.433	1.434
		What is the likelihood of your family returning to poverty/experiencing poverty?	3.73	1.035

(2) Core explanatory variables. The core explanatory variable of this study is internet use. According to the respondents' answers to the question "Is your home connected to broadband or Wi-Fi?", the internet use of forest farmers' families was portrayed. A "yes" answer is assigned a value of 1, which means that they use the internet; a "no" answer is assigned a value of 0, which means that they do not use the internet.

(3) Mediating variable. The mediating variable in this study is subjective class identity. According to the definition of subjective class identity proposed by the Jackmans [50], this is the individual's subjective perception of his or her position in the social class structure. In the context of social class structure identity, China's class identity has a trend of rapid increase in the proportion of middle- and lower-class identities [51]; social class identity does not exist independently from the objective material basis but is strongly influenced and regulated by market elements and social system factors. Therefore, this study starts from the two dimensions of subjective poverty and the economic development perception of forest farmers. The measurement of subjective poverty is based on the answer to the question "What type of poverty does your family belong to?", with the value of "family with special hardship and sudden difficulties" being assigned as 1, "family with unstable escape from poverty and family with marginal vulnerability to poverty" as 2, and "family with unstable escape from poverty and family with marginal vulnerability to poverty" as 2. The

value of "special hardship and sudden hardship family" is assigned as 1, "unstable poverty alleviation and marginal poverty-prone family" is assigned as 2, and "stable poverty alleviation and general farming family" is assigned as 3. The perception of economic development is based on the questionnaire's question "Do you think that the local economy is in a period of rapid development" and is assigned values of 1–5 in descending order. The larger the value, the higher the recognition of forest farmers of the rapid development of local society and economy.

(4) Control variables. Drawing on the studies of Cui [52] and Wang et al. [53] and combining the research data, this study incorporates a series of variables into the empirical analyses according to individual characteristics, family characteristics, and social characteristics. Among them, gender, age, and education level are selected as individual characteristics, and the square term of age is chosen to test the possible non-linear effect of age on the happiness of forest farmers' families. The family characteristics selected include family balance, family agricultural land per capita, family education expenditure level, family human expenditure per capita, the number of children, and whether or not they are members of a production organization. Social characteristics encompass the respondents' perception of the local social system, evaluation of policy implementation, and subjective evaluation of the extent of family benefits from poverty alleviation policies. In addition, considering the possible regional differences in internet use among forest farmers' families in different provinces, this study uses a regional dummy variable to control for regional effects in the sample area.

3.3. Methods for Measuring the Happiness of Forest Farmers' Families

The traditional happiness measurement method mainly relies on the subjective feelings of the interviewees to assign values, lacks the consideration of objective factors affecting happiness, and fails to organically combine objective and subjective factors, thus resulting in one-sided conclusions. In this study, the CRITIC-TOPSIS model was used to measure the happiness of forest farmers' families according to the statistical measurement method and the idea of happiness proposed by Le and Zhang [54], through the utilization of StataMP 17 software.

(1) CRITIC model. As a method to objectively evaluate the weights of indicators, the basic step of the CRITIC model is to first evaluate the contrast strength within the indicators based on two basic concepts, indicating the gap between the evaluation samples under the same evaluation indicator; second, to compare the conflict between evaluation indicators through the positive correlation strength between indicators; and third, to combine the contrast strength and conflict with the comprehensive measurement of the objective weight of the reflected indicators. The less information contained in the indicators, the smaller the intensity of comparison and conflict, and the smaller the weight of the corresponding indicators. The specific calculation formula is as follows:

Establish the judgment matrix. Assuming that there are n samples to be evaluated and m evaluation indicators in the model, the original assessment matrix is $X = (x)_{n*m}$, where x_{ij} denotes the value of the j evaluation indicator for the i sample.

Matrix normalization. Positive indicators:

$$Y_{ij} = \frac{x_j - x_{\min}}{x_{\max} - x_{\min}} \quad (1)$$

Negative indicators:

$$Y_{ij} = \frac{x_{\max} - x_j}{x_{\max} - x_{\min}} \quad (2)$$

The criteria matrix Y is obtained from the positive and negative indicators.

Dimensionless processing:

$$\begin{cases} \sigma_j = \sqrt{\frac{1}{n}\sum_{i=1}^{n}\left(y_{ij} - Y_j\right)^2}, j = 1, 2, 3, \ldots, m \\ T_j = \sum_{k=1}^{m}\left(1 - r_{jk}\right) \\ r = \frac{\sum(x-\overline{x})(y-\overline{y})}{\sqrt{\sum(x-\overline{x})^2}\sqrt{\sum(y-\overline{y})^2}} \\ C_j = \sigma_j * T_j \\ W_j = \frac{C_j}{\sum_{j=1}^{m} C_j} \end{cases} \tag{3}$$

In the above equation, σ_j is the standard deviation of each evaluation indicator, T_j is the quantitative value of conflict of each evaluation indicator, C_j is the amount of information contained in each evaluation indicator, and W_j is the weight value of each evaluation indicator.

(2) TOPSIS model. This model can make full use of the original information contained in the sample data and accurately reflect the gap between the evaluation samples. The method is not only applicable to small sample data but is also suitable for large sample and multi-indicator data. The algorithm calculates the Euclidean distance between the evaluation samples and the optimal solution and the worst solution, obtains the closeness of the evaluation samples to the ideal solution, evaluates the evaluation samples, and ranks them high and low. The specific calculation steps are as follows:

Calculate the weighted decision matrix Z. The weights W_j of each indicator, as calculated by the CRITIC model, are multiplied by the criteria matrix Y, then the weighted normalization matrix $Z = \left(z_{ij}\right)_{n*m}$ is calculated, where $z_{ij} = W_j Y_{ij}$.

Determine the positive and negative ideal solutions:

$$\begin{aligned} Z^+ &= \left\{ \max_{1 \le i \le n} z_{ij} \mid j = 1, 2, 3, \ldots, m \right\} = \left\{ z_1^+, z_2^+, z_3^+, \ldots, z_n^+ \right\} \\ Z^- &= \left\{ \min_{1 \le i \le n} z_{ij} \mid j = 1, 2, 3, \ldots, m \right\} = \left\{ z_1^-, z_2^-, z_3^-, \ldots, z_n^- \right\} \end{aligned} \tag{4}$$

The Euclidean distances between the values of each evaluation sample indicator and the positive and negative ideal solutions are calculated separately:

$$\begin{aligned} D_i^+ &= \sqrt{\sum_{j=1}^{m}\left(z_j^+ - z_{ij}\right)^2 w_j}, j = 1, 2, 3, \ldots, m \\ D_i^- &= \sqrt{\sum_{j=1}^{m}\left(z_j^+ - z_{ij}\right)^2 w_j}, j = 1, 2, 3, \ldots, m \end{aligned} \tag{5}$$

Calculate the relative closeness of each evaluation sample to the optimal level:

$$C_i = \frac{D_i^-}{\left(D_i^+ + D_i^-\right)} \tag{6}$$

The degree of proximity indicates the degree of proximity between the level of happiness of the forest farmers' families and the optimal level, with the value ranging between [0,1], where a larger C_i value represents the higher level of happiness of the forest farmers' families, and a smaller value represents a lower level of happiness.

3.4. Model Setting

(1) Tobit model. Since the score of the forest farmers' family happiness is between 0 and 1, which indicates truncated data, this study mainly adopts the Tobit model to analyze the data, and the specific model is set as follows:

$$Happiness_i = a_0 + a_1 net_i + a_{2n} x_i + \varepsilon_1, \varepsilon_1 \sim (0, \sigma^2) \quad (7)$$

In Equation (7), $Happiness_i$ denotes the happiness score of the forest farmers' families; net_i denotes the use of the internet by forest farmers' families i; x_i is each type of control variable, a_0 is the constant term, a_1 and a_i are the variable coefficients, and ε_1 is the random perturbation term; it satisfies the normal distribution.

(2) Mediation effect model. Referring to the mediation effect test method used by Wen et al. [55] to deeply analyze the influence mechanism of internet use on the happiness of forest farmers' families, this study sets the following mediation effect model:

$$Medium_i = b_0 + b_1 net_i + b_{2n} x_i + \varepsilon_2 \quad (8)$$

$$Happiness_i = c_0 + c_1 net_i + c_2 Medium_i + c_{3n} x_i + \varepsilon_3 \quad (9)$$

In Equations (8) and (9), $Medium_i$, net_i and $Happiness_i$ denote subjective class identity, internet use, and the family happiness of forest farmers, respectively; x_i denotes various control variables, b_0 and c_0 are constant terms, b_0, b_{2n}, c_1, c_2, c_{3n} are variable coefficients, and ε_2 and ε_3 are random perturbation terms. This study employs StataMP 17 software to estimate the Tobit model and the mediation effect model.

3.5. Sample Analysis

As shown in Table 2, the mean value of the happiness score of forest farmers' families is 0.515, which indicates that the respondents in the sample area had greater satisfaction with their family living conditions and a higher level of happiness. The proportion of respondents' families using the internet in the sample area reached 94.8 percent, indicating higher digital penetration and use in rural areas. Among the respondents, males accounted for 77.9% and females accounted for 22.1%, with the overall average age of the sample population being 51 years old. Overall, this distribution is close to the 20.1% female household head rate for Chinese families aged 50–54, as reported in the 2022 "China Population and Employment Statistics Yearbook", further demonstrating the rationality and reliability of the sample extraction structure. The average education level is 2.528, between primary school and junior high school, and about 73% of the respondents are ecological forest rangers. In terms of family characteristics, the mean value of family education expenditure was 1.779; the mean value of the number of children in the family was 1.892, indicating that the vast majority of families had two or more offspring; and 41.1% of the families were members of, or had cooperated with production organizations. Regarding social characteristics, the mean values of the respondents' perceptions of local society, policies, and poverty alleviation were all around 4, indicating that the respondents had a high degree of evaluation and recognition of local social development and policy implementation.

Table 2. Variable settings and descriptive statistics.

Variable Classification	Variable Name	Variable Definition	Average Value	Standard Deviation
Explained Variables	Forest farmers' family happiness	Measured by the forest farmers' family happiness evaluation indicator system	0.515	0.076
Core Explanatory Variables	Internet use	Whether your home is connected to broadband or Wi-Fi: Yes = 1, No = 0	0.948	0.223
Individual Characteristics	Gender	Male = 1, Female = 0	0.779	0.416
	Age	Age of respondents (years)	51.15	8.247
	Age squared	Considering the non-linear effect of the presence of age, age squared/100	26.842	8.457
	Education degree	0 = not of school age; 1 = illiterate or semi-illiterate; 2 = elementary school; 3 = junior high school; 4 = high school or secondary school; 5 = college and above	2.528	0.673
	Ecological forest ranger	Yes = 1, No = 0	0.73	0.445
Family Characteristics	Family balance	Difference between family income and expenditure, in logarithmic scale	2.841	1.754
	Family per capita agricultural land	Sum of family per capita cultivated land and per capita forest land, in logarithms	1.308	0.734
	Family education expenditure level	CNY 0 = 0; CNY 1–5000 = 1; CNY 5001–10,000 = 2; CNY 10,001–15,000 = 3; CNY 15,001–20,000 = 4; CNY 20,000 or more = 5	1.779	1.466
	Family per capita human expenditure	Family per capita expenditure on gifts, taking logarithms	6.218	2.142
	Number of children	Number of children in the family (persons)	1.899	1.12
	Production organization	Whether the family is a member of or cooperates with a production organization: yes = 1, no = 0	0.411	0.493
Social Characteristics	Social perception	Respondents' evaluation of the local social, political, and economic system, assigned from 1 to 5; the larger the score, the higher the recognition of the system	3.991	0.686
	Policy perception	Respondents' evaluation of the implementation of local policies, assigned from 1 to 5; the larger the score, the higher the recognition of the policy.	4.077	0.654
	Poverty alleviation perception	Respondents' evaluation of the degree of benefits brought to families by local poverty alleviation policies, assigned from 1 to 5 points; the larger the score, the higher the degree of benefits.	3.862	0.805

4. Results

4.1. Benchmark Regression

According to Table 3, it is evident that internet use consistently has a significant positive impact on the happiness of forest farmers, indicating that the use of the internet can significantly enhance forest farmers' family happiness, thereby confirming hypothesis H1. Among them, Regression (1) exclusively considers the variable relationship between internet use and the happiness of forest farming families, without incorporating control variables and regional dummy variables; Regression (2) controls for variables that may affect the happiness of forest farming families in terms of individual characteristics, family features, and social features; Regression (3) adds controls for regional dummy variables

based on Regression (2). According to Regression (3), each use of 1 unit of the internet can improve 0.031 units of forest farmers' family happiness. In terms of individual characteristics, both education degree and being an ecological forest ranger pass the significance test at a 5% level, with positive coefficients. This indicates that higher education degrees contribute to greater happiness in forest farming families. Additionally, serving as an ecological forest ranger meets the employment needs of forest farmers, increases family income, and promotes an enhancement in the overall happiness of forest farming families. In terms of family characteristics, none of the variables passed the significance test. Regarding the social characteristics, social perception and policy perception passed significance tests at 10% and 1%, respectively, with positive coefficients. This suggests that the higher the evaluation of social systems and policy implementation by forest farmers, the higher the level of happiness in forest farming families. However, poverty alleviation perception did not pass the significance test, possibly because the sampled forest farmers are predominantly of the small-scale poverty-alleviation type, leading to relatively small perceptual differences regarding poverty alleviation policies, thereby rendering the variable non-significant.

Table 3. Benchmark regression results.

Variable	OLS Model	Tobit Model	
	(1)	(2)	(3)
Internet use	0.036 *	0.026 ***	0.031 ***
	(1.908)	(2.730)	(3.940)
Gender		0.003	−0.006
		(0.161)	(−0.310)
Age		0.003	0.004
		(0.684)	(1.127)
Age squared		−0.003	−0.004
		(−0.763)	(−1.148)
Education degree		0.0010 *	0.013 **
		(−1.344)	(−1.012)
Ecological forest ranger		0.012 *	0.010 **
		(1.915)	(2.042)
Family balance		0.003	0.002
		(1.554)	(1.100)
Family per capita agricultural land		−0.012 **	−0.000
		(−2.182)	(−0.063)
Level of expenditure on education		−0.005	−0.004
		(−1.344)	(−1.0122)
Family per capita human expenditure		−0.001	0.002
		(−0.177)	(1.171)
Number of children		−0.002	−0.001
		(−0.599)	(−0.578)
Production organization		0.007	−0.001
		(0.811)	(−0.177)
Social perception		0.020 **	0.017 *
		(2.323)	(1.802)
Policy perception		0.019 ***	0.021 ***
		(3.844)	(3.365)

Table 3. *Cont.*

Variable	OLS Model (1)	Tobit Model (2)	(3)
Poverty alleviation perception		0.005 (1.250)	0.003 (0.821)
Constant term	0.481 *** (26.218)	0.247 *** (2.675)	0.152 * (1.836)
Region dummy variable	Yes	Yes	Yes
Observations	326	326	326
R^2	0.011	—	—
Adj. R^2	0.008	—	—

Note: Robust standard errors are in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

4.2. Mechanism Test

Building on the theoretical analysis in the preceding sections, this study employs Equations (7)–(9) for stepwise regression to examine whether internet use can contribute to the subjective class identification of forest farmers, enhancing their family happiness.

(1) Subjective poverty. Firstly, we utilize Equation (8) to analyze whether internet use can enhance the subjective poverty assessment of forest farmers. According to Regression (1) in Table 4, internet use has a significant positive impact on improving the subjective poverty evaluation of forest farmers through the significance test at the 10% statistical level. It shows that the use of the internet can prompt forest farmers to improve their subjective economic status evaluation, and they are more inclined to choose the high score evaluation of "stable poverty alleviation and general farmers" for their own poverty types; it also indirectly shows the importance of the rapid popularization of the internet and the construction of digital villages for rural revitalization and increased farmer income. Secondly, utilizing Equation (9), after introducing the subjective poverty variable, Regression (2) is obtained. Internet use has a significant positive impact on the family happiness of forest farmers, as confirmed by a significance test at the 10% level. Therefore, it can be concluded that the subjective poverty assessment of forest farmers plays a partial mediating role in the relationship between internet use and the family happiness of forest farmers, with the mediating effect accounting for 8.4% of the total effect. A possible reason is that the widespread use of the internet breaks the previous local information blockade with limited external communication, allowing forest farmers to experience the increased benefits, improved material foundation, and continuous enhancement of social systems brought about more tangibly by poverty alleviation policies. This leads to a more positive evaluation of their subjective poverty and more optimistic expectations for future family development. For family-run operations in forests, farmers will also be more inclined to sustainable use. The natural resources contained in forest land will also focus on long-term economic choices and ultimately continue to enhance the happiness of forest farmers' families.

(2) Economic development perception. First, regression analysis is conducted using Equation (8) to examine whether internet use can enhance economic development perception among forest farmers. The results of Regression (3) in Table 4 indicate that internet use has passed a significance test at the 5% level for forest farmers' economic development perception and the coefficient is positive, suggesting that internet use has a positive and constructive role in enhancing the economic development perception of forest farmers. Subsequently, incorporating the economic development perception variable on the foundation of the results for Regression (3) and conducting a regression test using Equation (9) produces the results for Regression (4). It is noticeable that internet use still demonstrates a positive influence on the happiness of forest farmers' families, with a significance level of 10%. This reveals the presence of a mediating effect in the relationship between forest farmers' perceptions of local economic development and the impact of

internet use on the happiness of forest farmers' families. Furthermore, it is identified as a partial mediating effect, constituting 13.08% of the overall effect. To some extent, this may be because forest farmers, through using the internet, have overcome geographical limitations and information cocoons. They can gather information about economic development and forestry policies from neighboring counties, cities, and even nationwide with the internet. Conducting both horizontal and vertical comparative analyses, they select forest management methods that suit their needs through information filtering. This process helps them establish their own channels for collecting forestry policy information and developing an awareness of environmental sustainability. Ultimately, this contributes to the increased happiness of the forest farmers' families.

Table 4. Mechanism analysis of the impact of internet use on the happiness of forest farmers' families.

Variable	Subjective Poverty (1)	Forest Farmers' Family Happiness (2)	Economic Development Perception (3)	Forest Farmers' Family Happiness (4)
Internet use	0.372 * (2.577)	0.028 * (2.877)	0.312 ** (3.677)	0.027 * (2.910)
Subjective poverty		0.007 ** (3.361)		
Economic development perception				0.013 ** (3.184)
Constant term	1.876 (2.095)	0.148 (1.957)	−0.216 (−0.153)	0.165 * (2.392)
Control variable	Yes	Yes	Yes	Yes
Region dummy variable	Yes	Yes	Yes	Yes
Observations	326	326	326	326
R^2	0.141	0.258	0.176	0.276
Adj. R^2	0.090	0.212	0.128	0.231

Note: Robust standard errors are in parentheses; ** $p < 0.05$, * $p < 0.1$.

In summary, it can be concluded that internet use can enhance the subjective poverty assessment of forest farmers, improve their perception of economic development, and promote an increase in the happiness of forest farmers' families. Hypothesis H2 is, thus, validated.

4.3. Heterogeneity Test

To further explore the relationship between internet use and the happiness of forest farmers' families and analyze the influence of internet use on family happiness among different groups of forest farmers, this study examines which groups of forest farmers use the internet to obtain more happiness from three aspects: gender, human capital, and ecological forest rangers.

(1) Gender heterogeneity. From the results of Regressions (1) and (2) in Table 5, it can be observed that internet use has a significant positive impact on the family happiness of male forest farmers, passing the significance test at the 1% level. Specifically, with an increase of one unit of internet use, the family happiness of male forest farmers will increase by 0.035 units. However, the happiness of female forest farmers did not pass the significance test. The possible reason for the above phenomenon is that the male group accounts for a large proportion of internet users in the sample area, and this pattern of internet use by men can be traced back to the main user groups of internet access in China [56]. The digital dividend thus obtained is more than that for the female group, and the digital impact is more lasting. The development of forest management and resource utilization through

the internet is seen earlier, and the positive impact on the family happiness of male forest farmers is more significant.

Table 5. Heterogeneity test results.

Variable	Male	Female	Low Human Capital	High Human Capital	Family with Ecological Forest Ranger	Family without Ecological Forest Ranger
	(1)	(2)	(3)	(4)	(5)	(6)
Internet use	0.035 ***	0.041	0.046 ***	0.007	0.038 ***	0.017
	(5.512)	(1.215)	(3.597)	(0.192)	(3.968)	(0.958)
Constant term	0.219 ***	0.132	0.110	0.265 **	0.311 **	0.116
	(3.169)	(0.650)	(0.765)	(2.113)	(2.221)	(1.420)
Control variable	Yes	Yes	Yes	Yes	Yes	Yes
Region dummy variable	Yes	Yes	Yes	Yes	Yes	Yes
Observations	254	72	167	159	238	88

Note: Robust standard errors are in parentheses; *** $p < 0.01$, ** $p < 0.05$.

(2) Human capital heterogeneity. Referring to the division method of human capital employed by Zhang et al. [57], this study divides the sample forest farmers into low human capital (primary school and below) and high human capital (junior high school and above), based on the education degree of the respondents, and carries out regression tests. The results are as shown for Regressions (3) and (4) in Table 5. Internet use has a positive impact on the family happiness of forest farmers with low human capital, and it is significant at the statistical level of 1%; that is, one unit of internet use will increase the family happiness of forest farmers with low human capital by 0.046 units. In contrast, the impact of internet use on high-human-capital forest farmers did not pass the significance test. A possible reason lies in the fact that in the sampled regions, internet use among forest farmers with low human capital tends to be primarily for entertainment and leisure. In contrast, forest farmers with high human capital use the internet for the "capital accumulation" of forest resources [58], thereby directly contributing to the development of e-commerce or diversifying other income channels. Therefore, compared to the long-term complexity of internet "capital accumulation", immediate entertainment and leisure activities are more pleasurable, contributing to the enhancement of happiness among those with low human capital.

(3) Heterogeneity of ecological forest rangers. Ecological forest rangers represent an innovative measure for China to achieve the victory of poverty alleviation. The sample area is located in the southwest forested area of China, with abundant forest resources and remarkable achievements made in the implementation of ecological forest ranger policy [59]. Therefore, analyzing the impact of internet use among ecological forest ranger groups on the happiness of forest farmers' families is of significant importance in uncovering factors for rural revitalization and digital rural development. Regressions (5) and (6) in Table 5 demonstrate that in forest farmers' families where family members take on the role of an ecological forest ranger, every unit increase in internet use is associated with a statistically significant increase of 0.038 units in family happiness, passing the significance test at the 1% level. The impact of internet use by family members who do not serve as ecological forest rangers on forest farmers' family happiness does not pass the significance test. One potential explanation for this is that ecological forest rangers create employment opportunities for nearby forest farmers, resulting in increased training in relevant ecological and environmental knowledge and in sustainable business skills. Additionally, the widespread application of a forest security patrol management system amplifies the likeli-

hood of forest farmers' exposure to and extensive use of the internet [60]. Consequently, the greater positive feedback generated from the occupation of ecological forest rangers tends to significantly enhance the sense of happiness in forest farmers' families.

4.4. Endogenous Test

Since the model may have endogenous problems of reverse causality and omitted variables, to ensure the robustness of the model and reduce the estimation bias, this study selects "whether to use the internet through skill training" as the instrumental variable according to the sample data construction. On the one hand, skills training has a strong correlation with internet use; on the other hand, internet use for skills training is generally a short-term behavior. In the long term, it does not have a direct impact on and substantial improvement of the happiness of forest farmers' families, so it meets the conditions of exogenous and endogenous. As shown in Table 6, the unidentifiable test indicates a K-P rk LM statistic of 18.298, rejecting the null hypothesis at the 1% level. In the weak instrument test, the C-D Wald F statistic is 43.120, significantly exceeding the critical value of 19.93 for the Stock–Yogo weak instrument identification test at the 10% significance level. Hence, there is no weak instrument issue. To minimize the loss of estimation efficiency and fully utilize the information in the sample data, this study employs the extended regression model (ERM) for instrumental variable regression. Additionally, a robustness check for the instrumental variable method is conducted using the 2SLS model. From the results of Table 6, both the ERM model and the 2SLS model show that internet use has a significant positive impact on the happiness of forest farmers' families, which is consistent with the results of Table 3, further verifying the research hypothesis H1.

Table 6. Endogenous test results.

Variable	ERM		2SLS	
	(1)	(2)	(3)	(4)
Instrumental variable	0.192 *** (0.025)		0.177 *** (0.041)	
Internet use		0.101 ** (0.046)		0.107 * (0.056)
Constant term	0.802 *** (0.022)	0.109 (0.104)	0.296 (0.349)	0.148 (0.094)
Control variable	Yes	Yes	Yes	Yes
Region dummy variable	Yes	Yes	Yes	Yes
K-P rk LM statistic			18.298 ***	
C-D Wald F statistic			43.120 ***	
Observations	326	326	326	326

Note: Robust standard errors are in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

4.5. Robustness Test

To ensure the robustness of the aforementioned tests, this study conducts robustness analysis using three methods: replacing the dependent variable, replacing the independent variable, and reducing the sample. The results are presented in Table 7. The first is to replace the dependent variable. In this study, the TOPSIS model is directly used to recalculate the happiness of forest farmers' families, and the scores are put into Equation (7) for regression. The regression results (1) show that Internet use still has a significant positive impact on the happiness of forest farmers' families at the statistical level of 1%.

Next is the replacement of the independent variable. In this study, respondents' answers to the question "Is cable TV signal connected" are used as a substitute variable for Internet use in regression. The answer "connected" is assigned 1, and the answer "not

connected" is assigned 0. Regression (2) in Table 7 indicates that cable TV signal connection has a significantly positive impact on the happiness of forest farmers' families, passing the 1% significance level test.

Table 7. Robustness test results.

Variable	Replace the Dependent Variable (1)	Replace the Independent Variable (2)	Reduce the Sample (3)
Internet use	0.021 *** (2.634)		0.039 *** (4.775)
Cable TV signal connection		0.034 *** (11.402)	
Constant term	0.294 *** (3.084)	0.176 ** (2.427)	0.304 ** (2.571)
Control variable	Yes	Yes	Yes
Region dummy variable	Yes	Yes	Yes
Observations	326	326	287

Note: Robust standard errors are in parentheses; *** $p < 0.01$, ** $p < 0.05$.

Finally, there is the reduction of the sample. According to the 51st "Statistical Report on China's Internet Development" by December 2022, the proportion of Chinese internet users aged 60 and above was 14.3%. The elderly internet user group is relatively small, making it challenging to provide effectively identifiable information for data analysis. Therefore, this study excluded forest farmer samples aged 60 and above and conducted regression analysis again. The results are shown in Table 7 regression (3). Even after reducing the sample, the happiness of forest farmers' families still demonstrates a significant positive impact from Internet use, passing the significance test at the 1% statistical level. It's evident that all three methods further affirm the robustness of the empirical results in this study.

5. Discussion

5.1. Impact of Internet Use on Forest Farmers' Family Happiness

The results of this study provide valuable empirical experience and policy insights for the construction of rural internet infrastructure, the enhancement of forest farmers' family happiness, and the sustainable use of forest natural resources in China's ecologically fragile ethnic areas. The research results indicate that for each additional unit of internet use, there will be a robust increase of 0.031 units in the happiness of forest farmers' families. This finding also supports the work of Hong and Chang [61] and of Lu and Kandilov [62] in China, suggesting that internet use continues to exert a significant positive influence on the happiness of farmer populations in countries outside China [63,64]. The use of the internet has an all-round and far-reaching impact on the happiness of forest farmers' families. Online shopping and the convenient information brought by the internet are unparalleled by other traditional technologies. The internet not only plays a distinct role in promoting the information acquisition and production decision-making of forest farmers' forest management [65] but also has a significant effect on the improvement of family happiness in the short term or long term. The constructed evaluation index system for the happiness of forest farmers' families employed in this paper, within the framework of sustainable development, encompasses both objective descriptions and subjective perceptions of the short-term family situation and societal development among forest farmers. It also incorporates the expectations of forest farmers regarding the long-term resilience and economic development of their families. Compared to the potential measurement bias that may arise from the univariate scoring used in previous studies to measure family happiness, this research comprehensively and objectively scientifically measures and investigates the happiness of forest farmers' families.

In terms of a controlled variable study, it is evident that the degree of education and ecological forest rangers in personal characteristics significantly positively affected the family happiness of forest farmers. The higher the education degree of forest farmers, the more efficient the mastery and application of digital technology, and the more effective it is to absorb forestry knowledge and safeguard forest property rights and interests through the Internet. This finding is consistent with previous research results [66]. It is worth noting that as an innovative measure of China's poverty reduction policy, ecological forest rangers have broadened the channels for forest farmers to get rich, expanded social welfare, and increased the probability of the forest farmers using digital technology to manage and protect forest resource security [60], and can also have a positive impact on forest farmers' family happiness. In terms of social characteristics, social perception and policy perception have a positive impact on forest farmers' family happiness. A good social system guarantee and effective policy implementation can give forest farmers a more secure and reliable community environment. The income increase and neighborhood mutual assistance brought about by it can release the tunnel effect and spillover effect of a wider influence, which also verifies the research of Easterlin et al. [67] and Liang et al. [68] to a certain extent. Among them, males have earlier access to the internet, and the advantages in terms of digital dividends and capital accumulation in the process of forest management that they experience compared to females are also evident, as reflected in the study by Zheng and Ma [69]. The study found that forest farmers with low human capital who use the internet tend to bring more happiness to their families. In contrast to those with high human capital who tend to use the internet for long-term development, those with low human capital show a preference for immediate internet entertainment to enhance happiness, rather than through long-term forest management and utilization to achieve forestry income growth and family happiness, which is different from the findings of previous studies [70]. As a fundamental poverty alleviation policy of the Chinese government, internet use by forest farmers with ecological forest ranger family members can bring more significant positive effects than internet use by families without ecological forest rangers. This may be due to the double superposition of the happiness effect brought by the forest management occupation and the life change brought by internet use.

The sustainable development of the forest economy depends on policies that incentivize environmentally friendly behavior among forest farmers. The internet's penetration and ubiquity in rural areas, along with the development of digital infrastructure and the formulation of environmental protection policies, have significant implications for forest management and timber production processes for forest farmers in China's ecologically fragile ethnic areas. The widespread use of digital technology in sustainable forest development can effectively improve the forest ecosystem [71]. Happiness is the pursuit of every individual, including forest farmers. The driving force of the happiness effect allows forest farmers to make their production choices more sustainable and environmentally friendly through internet use. They can access more policy information and news on clean production, environmental protection, and sustainable development. From a broader perspective, the emergence of the internet provides a bridge for forest farmers to improve happiness and achieve sustainable forest practices. On the one hand, internet use allows forest farmers to adopt more sustainable production and management methods, thereby enhancing productivity and ecological quality. On the other hand, long-term sustainable forest management can bring more economic income, strengthen development prospects, and consequently improve the happiness of forest farmers' families, achieving the integration of happiness and ecological protection.

5.2. Influence Path of the Subjective Class Identity Mechanism

Using the "Internet use—subjective class identity—forest farmers' family happiness" mediation model, the research discovered that internet use significantly enhanced two dimensions: the subjective poverty and the economic development perception of forest farmers. Both dimensions had a significant impact at the 5% significance level, contribut-

ing partial mediation effects of 8.4% and 13.08%, respectively, to forest farmers' family happiness. This conclusion is also supported by the studies of Markussen et al. [72] and of Liu and Cheng [73]. Theoretically, family happiness is an effective way to assess the overall satisfaction of forest farmers regarding living conditions and emotional values. It can reflect improvement in the living standards, social welfare, and overall development of forest farmers [74–76], leading to the derivation of forest farmers' value judgments about their social class and the social environment that they are in. Furthermore, it can also reflect the inclination of forestry farmers' internet use toward information decision-making and management in forestry operations and resource utilization. On the one hand, the forest farmers in the sample area are poverty-stricken. Although they have eradicated absolute poverty through ecological poverty reduction policies, there are still risks in widening the gap between the rich and the poor within the village and the risk of families returning to poverty. Therefore, the study of the intermediary effect of forest farmers' self-subjective poverty evaluation can reflect the forest farmers' judgment regarding the accumulation of livelihood capital through forestry production after poverty alleviation and can further explore the transmission mechanism of forest farmers' internet use for family happiness and their potential inclination toward resource utilization and environmental protection in the context of digital rural construction. On the other hand, over the past few decades, the Chinese government has consistently invested substantial infrastructure construction funds and forestry industry subsidies in poverty-stricken areas, providing as much public financial support as possible. This has led to significant improvements in public services such as road transportation, broadband internet, industrial development, and social healthcare in these poverty-stricken areas. From a macro perspective, this can reflect sustained economic development in poverty-stricken areas, while from a micro perspective, it represents the perception and evaluation of local economic development and forestry policy by forest farmers as direct beneficiaries. Additionally, internet use can narrow the digital divide [77], creating a virtuous circle between economic development and digital technology to enhance the happiness of forest farmers' families.

While this study has its merits, there are still specific limitations that warrant further consideration. Firstly, this study primarily focuses on forest farmers and their families, without exploring the effects of internet use by neighboring villages and fellow villagers on family happiness. Secondly, this study examines the happiness of forest farmers' families in ecologically fragile ethnic areas using cross-sectional data, thereby lacking a long-term perspective to analyze the impacts of internet technology and other possible policies on the happiness of forest farmer households. Future research could explore a broader analysis framework of family happiness among forest farmers within the framework of sustainable forest management and could purposefully design quasi-natural experiments to evaluate and measure the impact of internet use on the happiness of forest farmers' families. Finally, the proportion of forest farmers using the internet in this study is relatively high, which may mean that the views and experiences of non-internet users are not fully considered. Therefore, future research should consider the perspectives and opinions of non-internet users more comprehensively to obtain a more comprehensive understanding of the impact of the internet on forest farmers' happiness. Despite these limitations, the theoretical foundation of this study is solid, and the research methods are scientifically sound, ensuring the robustness and effectiveness of the research results.

6. Conclusions

Based on the field survey data from ecologically fragile ethnic areas, this study constructs an evaluation index system of forest farmers' family happiness. The CRITIC-TOPSIS model is applied to calculate the happiness score, then the Tobit model and the mediating effect model are utilized for a comprehensive analysis of the role, mechanism, and effect of internet use on forest farmers' family happiness. The results are as follows.

Firstly, the use of the internet is conducive to improving the family happiness of forest farmers. Every unit of internet use can bring 0.031 units of improvement to the happiness of

forest farmers' families. Among them, the education degree, social perception, and policy perception of forest farmers all pass the significance test, which has a positive impact on the improvement of forest farmers' family happiness.

Secondly, the use of the internet can promote the positive evaluation of forest farmers on their own subjective poverty, enhance the level of forest farmers' perception of economic development, and thus promote the improvement of forest farmers' family happiness. Specifically, both subjective poverty and economic development perception play a partial mediating role in the relationship between Internet use and forest farmers' family happiness, and the mediating effect accounts for 8.4% and 13.08% of the total utility, respectively.

Finally, through heterogeneity analysis of the sample, it can be seen that internet use significantly and positively increases family happiness among forest farmers in the male group, the low human capital group, and families that include ecological forest rangers. However, the significance test did not support the impact of internet use on family happiness among forest farmers in the female group, the high human capital group, and in families without ecological forest rangers.

Combined with the main research conclusions drawn from this study, the following enlightenment can be obtained.

Firstly, it is necessary to expedite the development of digital rural areas, actively increase the rural internet penetration rate, and enhance the construction of digital infrastructure. This will facilitate the profound integration and development of the digital economy and rural revitalization. The advancement of network technology has infiltrated every facet of residents' lives. Hence, it is crucial to make effective use of policies promoting internet accessibility and digital infrastructure development. This includes intensifying efforts to promote digital development in less advanced regions and among specific demographic groups. For forest farmers, introducing inclusive and sustainable emerging development models of forestry like digital forestry and digital ecology can play a role in supporting rural revitalization.

Secondly, it is vital to cultivate and attract specialized forestry professionals as digital talents in rural areas. Simultaneously, digital technology training and promotion should be provided for forest farmers to enhance their digital literacy, narrowing the urban–rural digital literacy gap. Educational level is one of the main factors triggering the digital divide in rural populations [78] and is also a significant influencing factor on the happiness of forest farmers' families. Therefore, on the one hand, it is essential to formulate specialized plans for cultivating and attracting forestry professional digital talents in rural areas, establishing a dual guarantee of internal training and external incentives for the long-term reserve and orderly expansion of talent. On the other hand, there should be a focus on enhancing the digital awareness and skills of forest farmers, fostering a sense of sustainable development and environmental protection consciousness. This includes conducting digital literacy improvement and skills training for groups such as female forest farmers, promoting an increase in the happiness of forest farmers' families.

Finally, the subjective class identity of forest farmers has a happiness effect. Therefore, in the process of internet popularization, there is a need to focus on digital equity in digital forestry production, paying attention to the subjective poverty and social development perception of individual forest farmers. In the context of the rapid influx of internet information and the generally low level of education among forest farmers, it is necessary to guide forest farmers in establishing a class identity concept and social values beneficial for the sustainable development of forests. Simultaneously, as forest farmers form subjective class identities through the internet, it is important to guide them in effectively deepening ecological values and sustainable management into forestry production practice and enhancing the happiness of forest farmers' families.

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