

Article

Research on the Influence of Ecological Environment Satisfaction and Income Level on Chinese Residents' Happiness: Empirical Analysis Based on CGSS Data

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Abstract: Enhancing residents' happiness is a fundamental goal of development and a priority for government action. This article conducts a theoretical analysis of the impact of the ecological environment and income level on residents' happiness and uses data from the Chinese General Social Survey (CGSS) in 2017 to construct an ordered probit model. The model examines the mechanisms of ecological environment satisfaction and income level on residents' happiness. The study reveals that (1) residents' satisfaction with the ecological environment has a significant positive effect on their happiness, which is consistent across urban–rural and regional contexts. (2) Both absolute and relative income have a significant positive effect on residents' happiness, with relative income having a greater influence than absolute income. (3) Income level can regulate the impact of ecological environment satisfaction on residents' happiness, indicating that an increase in residents' income level weakens the effect of ecological environment satisfaction on their happiness. (4) Residents' absolute income mediates the process by which ecological environment satisfaction impacts their happiness. These findings enhance our understanding of the relationship between the ecological environment, income level, and residents' happiness, and provide new ideas for government action aimed at improving residents' happiness.

Keywords: residents' happiness; ecological environment satisfaction; income level; ordered probit model



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1. Introduction

Over the past 40 years, China has achieved sustained and rapid economic growth since the beginning of its reform and opening-up policy. China's GDP has grown at an average annual rate of 9.6%, which is much higher than the global economy's average annual growth rate of less than 3%. This remarkable progress indicates a significant improvement in the material living standards of the Chinese people. According to utility theory, economic growth brings more material wealth to the people, which, in turn, enhances their material living standards and plays a positive role in enhancing residents' happiness. However, despite this economic success, the overall level of happiness among Chinese residents remains low. The World Happiness Report 2022, released by the United Nations, shows that China ranks 72nd out of all 146 countries participating in the ranking, which places it in the middle range. Although the ranking has improved compared to the past few years, the overall happiness index remains low, leaving significant room for improvement. In the 20th Party Congress report, General Secretary Xi Jinping proposed enhancing the people's well-being and improving their quality of life. Happiness, as a crucial indicator reflecting people's livelihood, reflects people's authentic feelings about various aspects, such as the economy, society, and the environment. Therefore, exploring ways to enhance residents' happiness to improve people's well-being is a top priority of China's current development tasks and a key topic of academic research.

In 2010, China overtook Japan to become the second largest economy in the world, and the economic level has grown rapidly. However, the people's happiness is not high, which indicates that the economic development and residents' happiness in China have not increased simultaneously [1,2], and the "Easterlin paradox" also exists in China. This paradox suggests that during the period of economic growth, the impact of the increase in income level on residents' happiness first increases and then decreases [3]; that is, there is an inverted "U" type relationship between economic growth and residents' happiness. The reason for this paradox is that the high economic growth has a negative impact on the ecological environment on which the residents depend, and the poor ecological environment will endanger the physical and mental health of the residents and lead to a decrease in their happiness instead of an increase [4]. According to the "Bulletin of China's Ecological Environment Status" published by the Ministry of Ecology and Environment, China has different degrees of pollution in air quality, water quality, and land resources. This indicates that in the process of past rough development, the pursuit of high economic growth to improve the income level of residents has also ignored the importance of ecological environmental protection. The contradiction between ecological protection and economic development is still prominent, and this contradiction has become an important problem for people's livelihood and a pain in the people's heart. In view of the goal of "improving people's well-being" proposed by the 20th National Congress, solving the contradiction between ecological environmental protection and economic development is the right thing to do to improve people's well-being and to meet the people's desire for a better life. In this context, it is particularly important to study how the ecological environment and people's income level affect residents' happiness.

In this paper, we will study the impact on residents' happiness from two perspectives, ecological and environmental satisfaction and income level. Through this, we will try to find the relationship between these three factors and their mechanisms of action, in order to fundamentally solve the contradiction between ecological and environmental protection and economic development, as well as to formulate corresponding policies and measures for government departments to improve residents' happiness.

2. Literature Review

2.1. Subjective Happiness Measure

The primary issue in the study of happiness is how to measure subjective happiness. Scholars have now conducted extensive research on the issue of happiness measurement. The first commonly recognized measure is the utility theory, and the American economist Samuelson [5] proposed a famous happiness formula: happiness = utility/desire, arguing that happiness shows a positive relationship with effects and an inverse relationship with desires. Later, Diener et al. [6] introduced a scale to measure global life satisfaction, the Satisfaction with Life Scale (SWLS), to assess subjective happiness with high internal consistency and predictable correlations, and for different age groups. Lyubomirsky and Lepper [7] introduced a global subjective happiness method, developed based on a subjectivist approach measure, which was validated in 14 studies and found to have high internal consistency and stability, confirming its structure for measuring subjective happiness. Kahneman and Kruger [8] proposed a daily reproducible measure of happiness based on a combination of time budgets and experience sampling. Carrero et al. [9] synthesized the main factors and a set of theory-driven hypotheses of positive psychology on the constitutive dimensions of happiness and proposed a mathematical model given by a system of nonlinear ordinary differential equations describing the dynamics of a person's well-being over time.

2.2. Subjective Happiness Research

The term subjective happiness was initially a specialized term in psychology, which defined subjective happiness from the perspective of the psychological discipline as an individual's self-evaluated happiness. It considered happiness as the evaluator's personal overall assessment of his or her quality of life [10], while having the characteristics of

subjectivity, wholeness, and relative stability. After a long period of cross-development between various disciplines, the study of subjective happiness has also long gone beyond the realm of psychology to become a research hotspot in sociology and economics [11], and rich results have been achieved in the study of factors affecting subjective happiness. Existing studies show that scholars' research on factors influencing subjective happiness can generally be divided into external and internal factors. External factors refer to social and family factors, etc., which affect individuals' behavioral habits, mainly including economic status [12,13], cultural differences [14,15], marital status [16,17], children's situation [18,19], and social support [20,21]. Internal factors refer to their own physiological conditions and self-awareness, etc., which may affect the formation of individuals' behavioral habits, mainly including gender [22,23], personality [24,25], health [26,27], religious beliefs [28,29], and values [30,31]. In addition to these, factors such as educational status [32,33] and insurance [34,35] also have a significant impact on residents' happiness.

2.3. Study on Ecological Environment and Residents' Happiness

In recent years, the relationship between the ecological environment and residents' happiness has become an increasingly important topic. A good ecological environment is the cornerstone of people's well-being [36], while environmental pollution problems can negatively affect the physical and mental health of residents [37]. Existing studies have mainly investigated the ecological environment affecting residents' happiness from three aspects: air pollution, water pollution, and land pollution.

Air pollution is a major ecological problem that has been repeatedly shown to have a significant negative impact on residents' happiness. Studies have found that exposure to air pollution leads to an increased incidence of respiratory and cardiovascular diseases, which, in turn, leads to a decrease in happiness [38,39]. Water pollution is another major environmental issue associated with a decrease in residents' happiness, with contaminated water sources leading to an increase in the incidence of waterborne diseases, which negatively affects physical health and quality of life [40]. Land pollution is the third major environmental problem associated with decreased residents' happiness. Contaminated land leads to an increase in the rate of contamination of trace elements in the soil, which has a serious impact on the health of the population and, consequently, leads to a decrease in residents' happiness [41]. In addition, land systems, especially land consumption, can also negatively affect the subjective happiness of local residents [42]. In summary, studies have shown that the ecological environment is an important factor in determining residents' happiness. Air pollution, water pollution, and land pollution are all serious environmental problems that can negatively affect residents' happiness.

2.4. Study on Income Level and Residents' Happiness

Level of income is one of the very important factors affecting residents' happiness, so there is a wealth of research on income level and happiness. As early as the 1970s, Easterlin had already started to study the relationship between income and happiness and found that an increase in income or possessing more wealth did not lead to more happiness; he again proved this idea in his later studies [43]. The existing literature focuses on the effect of absolute and relative income on residents' happiness and mostly confirms that the effect of income level on happiness is significant. In terms of absolute income, Alesina et al. [44] and Graham and Felton [45] found that the absolute income level of residents has a significant impact on their subjective happiness through a study of national survey data from European and American countries. Inglehart [46] used WVS data to conclude that a country's GDP per capita is positively related to its national subjective happiness, but if the per capita GDP exceeds a certain threshold value, the correlation becomes progressively blurred. In terms of relative income, Ferrer-i-Carbonell [47] found through their study that income is the factor that has a greater degree of influence on residents' happiness under the condition that other objective factors are considered, and relative income is positively correlated with residents' happiness, the higher the relative income of residents, the higher the level of

residents' happiness. In contrast, Jorgensen and Jamieson [48] have a different finding, they found that relative income has no significant effect on residents' happiness when the average income of all households is used as the reference group through a survey study of more than one thousand residents in Australia. Some other scholars break through the national boundaries to study the relationship between relative income and residents' happiness. For example, Diener et al. [49] argued that the affluence of neighboring countries has a positive effect on the happiness of their own residents; the richer the neighboring countries are, the higher the happiness of their own residents.

Numerous studies have been conducted to delve into the impact of the ecological environment and income level on residents' happiness, and these have yielded fruitful results. Nevertheless, the contradiction between ecological environment protection and economic development is a reality that cannot be ignored, and studying residents' happiness cannot solely focus on one of these factors. Thus, it is imperative to incorporate both variables within the same analytical framework to investigate their influence on residents' happiness. Furthermore, previous research on the impact of ecological the environment on residents' happiness has mainly concentrated on objective environmental pollution, disregarding the subjective impact of residents' ecological environment satisfaction. In light of this, this paper seeks to enhance residents' happiness by considering the perspectives of ecological environment satisfaction and income level. By utilizing data from the 2017 Chinese General Social Survey, this study undertakes a theoretical analysis of the relationship between these three factors, based on previous research, and puts forth four plausible hypotheses. These hypotheses are scrutinized and validated through the construction of an ordered probit model. This paper makes a certain contribution to the research on the relationship between the ecological environment, income level, and residents' happiness.

3. Research Hypotheses

3.1. Relationship between Ecological Environment Satisfaction and Residents' Happiness

With the rapid growth of China's economy, the income level of residents has been raised, their material living standard has been satisfied to a greater extent, and a comfortable ecological environment has pursued by more and more people. Additionally, the quality of the ecological environment has become an important factor affecting residents' happiness [50].

At the individual level, the influence of the ecological environment on residents' happiness is mainly reflected in two aspects. On the one hand, the ecological environment can indirectly affect residents' happiness by influencing their physical health status. It has been shown that environmental pollution can negatively affect residents' physical health and reduce their happiness [37]. In contrast, a good ecological environment can significantly enhance residents' sense of security and improve their happiness. Ecological environment can also indirectly affect residents' happiness by influencing their mood. For example, air pollution can negatively affect residents' mental health status [51,52] and can easily make residents feel depressed, which, in turn, may lead to a decrease in happiness. Generally speaking, a comfortable environment can be soothing and pleasant, while a bad environment can bring irritability and unhappiness. There are also group differences in the happiness of Chinese residents because the problem of unbalanced and insufficient economic and social development in China is still relatively prominent, mainly in terms of uncoordinated urban–rural development and unbalanced regional development. Studies have shown that during 2010–2012, there was an urban–rural, as well as regional (east, central and west), impact of subjective air pollution on residents' happiness heterogeneity [53]. The effect of environmental quality on residents' happiness in urban–rural and regional groups is not the same, but does the heterogeneity of this effect continue to exist in 2017? After China's successive policies of precise poverty alleviation and poverty eradication in 2013 and 2015, the incidence of poverty in China decreased from 10.2% in 2012 to 3.1% in 2017. Therefore, compared with the more affluent cities and towns and the eastern region, the residents of rural areas and the central and western

regions have also started to pay great attention to the ecological environment under the condition of greater satisfaction of their material living standards, which is also a new requirement from the reality of the change of the main contradiction of our society in the new era. The better the quality of the ecological environment, the higher the residents' ecological environment satisfaction will be, and by positively influencing the physical and mental health of residents, their well-being and happiness will be enhanced, and there is no heterogeneity between urban and rural areas and regions. Based on this, the following research hypothesis is proposed:

H1. *Ecological environment satisfaction positively correlates with residents' happiness, with no urban–rural or regional differences.*

3.2. Relationship between Income Level and Residents' Happiness

The relationship between income levels and residents' happiness has been a popular topic of scholarly research, and one of the typical questions is “whether higher income necessarily increases happiness”. Initially, according to the “utility theory”, scholars believed that an increase in income would enhance people's happiness, until Easterlin gave a new interpretation of this issue in 1974. His research showed that residents' happiness no longer increased with income growth up to a certain level, a finding also known as the “happiness paradox”. However, some scholars in subsequent studies found that there is a certain pattern of this paradox. They believe that in economically developed regions or developed countries, the increase of income will not improve residents' happiness, while in economically backward regions or developing countries, the increase of income will still significantly improve residents' happiness. Combined with the development of China, although socialism with Chinese characteristics has entered a new era and the main social contradiction has been transformed into the contradiction between the people's growing need for a better life and unbalanced and insufficient development, China's international status as the largest developing country remains unchanged. Therefore, Chinese residents still attach great importance to their absolute income, which can improve their living standards and enhance their happiness.

With further research, some scholars began to introduce relative income theory to analyze the relationship between income level and residents' happiness. They believe that people not only care about their absolute income, but also determine their relative position by comparing with others. The introduction of relative income theory provides a very important perspective in explaining the “Easterlin paradox”. Specifically, although the absolute income of an individual has been increased, if it is lower than the average absolute income of the society as a whole, the income gap will be further widened, and individual happiness may decrease instead of increase. Therefore, this study proposes the following hypothesis:

H2. *Absolute income and relative income positively correlates with residents' happiness, and relative income has a stronger impact on residents' happiness than absolute income.*

3.3. Moderating Effect of Income Level

China's rapid economic development stage has caused certain pollution to the ecological environment, and, thus, has two effects on residents' happiness. On the one hand, rapid economic development brings material satisfaction to residents and enhances their happiness; on the other hand, the environmental pollution caused by economic growth negatively affects residents' physical health and emotions and reduce their happiness. Between the gains and losses, the impact of the ecological environment and income level on residents' happiness cannot be concluded simply by considering them together.

According to Maslow's hierarchy of needs theory, an individual's hierarchy of needs largely depends on the degree of satisfaction of his or her lower-level needs. For example, residents with different incomes have different requirements for ecological environment

quality, and those with higher incomes will have higher requirements for ecological environment quality [54]. The higher the income of the residents, the more their material life can be satisfied, and their demands for ecological environment quality may be higher, and they hope to have a more beautiful ecological environment. Therefore, for residents with different incomes, the degree of the influence of the ecological environment quality on their happiness may be inconsistent. Linxiang Ye et al. found that the higher the income level of residents, the greater the negative impact of environmental pollution on their happiness [55]. The above suggests that income level has a moderating effect on ecological environment satisfaction, affecting residents' happiness to a certain extent. Thus, this paper proposes the following hypothesis:

H3. *The effect of ecological environment satisfaction on residents' happiness is moderated by their income level.*

3.4. Mediating Effect of Absolute Income

According to the environmental value theory, protecting the ecological environment is also a kind of interest pursuit, which coincides with the development concept that green water and green mountains are the silver mountain of gold. To protect the ecological environment is to protect productivity, and to protect productivity is to create greater value. Therefore, after the quality of the ecological environment becomes better, it means that productivity can be further liberated and income in economic activities, such as agriculture, forestry and pastoralism, will be higher. Meanwhile, the developed environmental protection industry and stable and reliable ecological environment are conducive to the development of enterprises. New industries will emerge and investment opportunities will increase, thus improving employment opportunities and so the absolute income of local residents will increase in this regard. As General Secretary Xi Jinping said in March 2014, when attending the deliberations of the Guizhou delegation at the second session of the 12th National People's Congress: "Fish live in water and grass, birds choose good wood. If all other conditions are available, who would not want to invest, develop, work, live and travel in a place with green water and green mountains? In this sense, green water and green mountains are both natural wealth and social and economic wealth". To sum up, higher ecological environment satisfaction means better ecological environment quality, and better ecological environment quality, in turn, represents a higher absolute income for residents. Therefore, ecological environment satisfaction will affect residents' happiness by affecting their absolute income, and residents' absolute income has a mediating role in the process of ecological environment satisfaction affecting residents' happiness. Therefore, this study proposes the following hypothesis:

H4. *Residents' absolute income has a mediating effect in the process of ecological environment satisfaction on their happiness.*

The analytical framework and research hypotheses of this paper are shown in Figure 1.

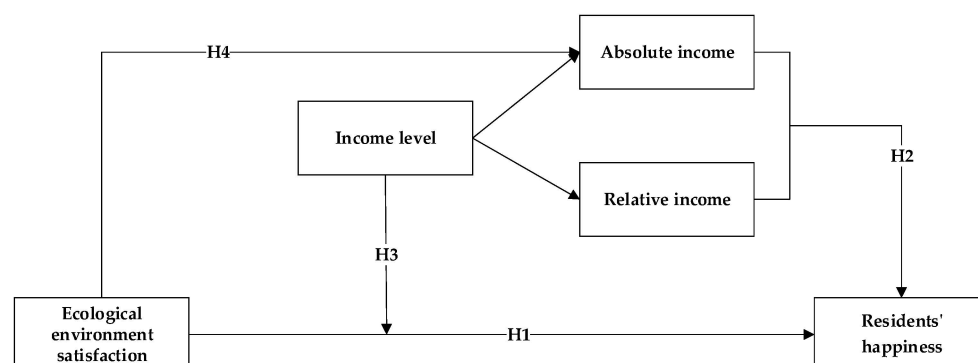


Figure 1. Analytical framework and research hypotheses.

4. Data and Model

4.1. Data

4.1.1. Data Source

The data used in this study were obtained from the Chinese General Social Survey (CGSS) project, which is the first comprehensive and continuous large-scale social survey project in China, covering data on various aspects of Chinese society, communities, households, and individuals. In 2017, the CGSS utilized a multi-order stratified PPS random sampling method to obtain a total of 12,582 samples. Among them, income level, residents' happiness, and control variables were selected from modules A and C, with a sample size of 12,580; ecological environment satisfaction variables were selected from module D, with a sample size of 4132. In order to maintain data consistency, 4132 samples were retained, and then 3095 valid samples were finally determined for this study by removing blank data, invalid data, and erroneous values contained in the samples.

4.1.2. Variables Description

Explained variable: Residents' happiness is the explanatory variable in this paper, and the data of this variable is obtained from the questionnaire that asked the respondents, "In general, do you think your life is happy?" In this question, respondents were asked to choose from "1" for "very unhappy" to "5" for "very happy, meaning "The higher the number, the happier the person". Overall, the residents in the sample selected for this paper reported a high level of happiness, with 17.67% responding "very happy", 60.97% responding "relatively happy", and less than 8% responding "relatively unhappy" or "very unhappy".

Explanatory variables: The explanatory variables in this paper are ecological environment satisfaction and income level. Ecological environment satisfaction is measured by the question, "I am satisfied with the natural environment around me" in the questionnaire, and the higher the number from "1" to "6", the more satisfied they are. Income levels can be divided into absolute income and relative income. The residents sampled for this paper expressed a high level of satisfaction with their natural environment, with 45.78% indicating "agree" or "strongly agree", and only 12.98% indicating "disagree" or "strongly disagree".

Absolute income is measured using the total income of the individual in the questionnaire for the last year. Relative income can be measured either horizontally, such as by using a factor selected by the researcher as the reference group, or vertically, such as by using a factor selected by the respondent (e.g., socioeconomic status) as the reference group. In this paper, the longitudinal comparison method is used to measure relative income by the socioeconomic status in which the respondents in the questionnaire answered that they were. Overall, the relative income of the sample residents were not high, with over 58% of residents in the "lower" or "lower middle" class and approximately only 5% in the "upper middle" or "upper" class.

Control variables: In order to minimize the error due to omitted variables, this paper draws on existing studies [56,57], and uses residents' personal basic factors as control variables, including age (age), gender (gender), marital status (marry), health status (health), education level (education), political identity (politic), religious belief (religion), sense of social fairness (fair), social trust (trust), medical insurance (medical), social insurance (endowment), and social class (class), as shown in Table 1.

Table 1. Variables definition and descriptive statistics.

Variables	Variables Definition	Mean	Std.Dev	Min	Max
happiness	very unhappy = 1; relatively unhappy = 2; cannot say happy or unhappy = 3; relatively happy = 4; very happy = 5	3.868	0.832	1	5
environment	strongly disagree = 1; disagree = 2; somewhat disagree = 3; somewhat agree = 4; agree = 5; strongly agree = 6	4.106	1.214	1	6
lnabsinc	last year's total revenue is taken as the natural logarithm	9.955	1.337	4.61	16.11
relinc	lower = 1; lower middle = 2; middle = 3; upper middle = 4; upper = 5	2.241	0.859	1	5
age	CGSS survey year minus respondent's birth year	51.80	16.16	18	93
gender	male = 1; female = 0	0.499	0.500	0	1
marry	married = 1; unmarried = 0	0.865	0.341	0	1
health	very unhealthy = 1; relatively unhealthy = 2; average = 3; relatively healthy = 4; very healthy = 5	3.502	1.058	1	5
education	no education at all = 0; private school, literacy class = 1; elementary school = 6; junior high school = 9; vocational high school, general high school, junior college, technical school = 12; university college = 15; undergraduate college = 16; graduate and above = 19	9.382	4.641	0	19
politic	party member = 1; non-party member = 0	0.129	0.335	0	1
religion	religious = 1; not religious = 0	0.895	0.307	0	1
fair	completely unfair = 1; comparatively unfair = 2; not fair but not unfair = 3; comparatively fair = 4; completely fair = 5	3.123	1.057	1	5
trust	strongly disagree = 1; relatively disagree = 2; cannot say I agree or disagree = 3; relatively agree = 4; strongly agree = 5	3.480	1.031	1	5
medical	participated = 1; did not participate = 0	0.944	0.230	0	1
endowment	participated = 1; did not participate = 0	0.784	0.412	0	1
class	self-perception of your social class, from low to high 10 classes, respectively, assigned 1 to 10	4.198	1.685	1	10

Data source: Compiled from the 2017 Chinese General Social Survey data.

4.2. Model

Since the explained variable residents' happiness is a discrete variable and there is an obvious ordinal relationship between the options, the more widely used ordered probit model is chosen in this paper to test the effects of ecological environment satisfaction and income level on residents' happiness. It should also be noted that the regression results in the ordered probit model are estimated coefficients, not marginal effects, which cannot visually express the economic meaning, and need to be calculated separately when analyzing the marginal effects.

Based on the theoretical analysis and the proposed hypothesis above, this paper first constructs the following model to verify the influence of ecological environment satisfaction on residents' happiness.

$$Happiness_i = \gamma_0 + \gamma_1 environment_i + \gamma_2 control_i + \varepsilon_i \quad (1)$$

In Equation (1), I represents the i th sample, $Happiness$ denotes residents' happiness; $environment$ denotes residents' ecological environment satisfaction; $control$ represents control variables, including residents' age, gender, marital status, and other personal basic factors; and ε_i is a random disturbance term.

Second, the following model is constructed to verify the effect of income level on residents' happiness. The model is similar to Equation (1).

$$Happiness_i = \eta_0 + \eta_1 \ln absinc_i + \eta_2 relinc_i + \eta_3 control_i + \varepsilon_i \quad (2)$$

In Equation (2), $lnabsinc$ denotes the absolute income of residents, taking the natural logarithm form of residents' total income last year; $relinc$ denotes the relative income of residents; other explanatory variables and symbols are the same as in Equation (1).

Then, to further explore whether the income level of residents can moderate the effect of ecological environment satisfaction on their happiness, this paper introduces the interaction term of ecological environment satisfaction and income level based on Levinson's study [58] and constructs the model as follows.

$$Happiness_i = \lambda_0 + \lambda_1 environment_i + \lambda_2 \ln ab \sin c_i + \lambda_3 environment_i \times (\ln ab \sin c_i - \overline{\ln ab \sin c_i}) + \lambda_4 control_i + \varepsilon_i \quad (3)$$

$$Happiness_i = \mu_0 + \mu_1 environment_i + \mu_2 relinc_i + \mu_3 environment_i \times (relinc_i - \overline{relinc_i}) + \mu_4 control_i + \varepsilon_i \quad (4)$$

In Equations (3) and (4), $\overline{\ln ab \sin c_i}$ and $\overline{relinc_i}$ are the sample means of absolute income and relative income, respectively; the other explanatory variables and signs are the same as in Equation (1).

Finally, in order to verify whether the absolute income of residents has a mediating role in the process of ecological environment satisfaction affecting residents' happiness, this paper constructs a model based on the mediation effect test process summarized by Zhonglin Wen and Baojuan Ye [59] in 2014, as follows.

Verifying the effect of ecological *environment* satisfaction on residents' happiness.

$$Happiness_i = \beta_0 + \beta_1 environment_i + \beta_2 control_i + \varepsilon_i \quad (5)$$

Validation of the effect of ecological *environment* satisfaction on absolute income.

$$\ln ab \sin c_i = \alpha_0 + \alpha_1 environment_i + \alpha_2 control_i + \varepsilon_i \quad (6)$$

The existence of mediating effects was verified by putting both ecological environment satisfaction and absolute income into the equation as explanatory variables.

$$Happiness_i = \delta_0 + \delta_1 environment_i + \delta_2 \ln ab \sin c_i + \delta_3 control_i + \varepsilon_i \quad (7)$$

According to Zhonglin Wen's study, the first step is to test the regression coefficient β_1 of Equation (5), and if it is significant, it is discussed as a mediating effect. If not, it is discussed as a masking effect, but whether it is significant or not, a follow-up test will be conducted.

In the second step, the regression coefficient α_1 of Equation (5) and the regression coefficient δ_2 of Equation (6) are tested in turn, and if both are significant, they have a significant indirect effect and go to the fourth step. If one is not significant or both are not significant, proceed to the third step.

In the third step, the Bootstrap method is used to test that $H_0: \alpha_1 \delta_2 = 0$. If significant, there is a significant indirect effect and the fourth step is performed. If not, the analysis is stopped.

In the fourth step, the regression coefficient δ_2 of Equation (5) is tested, and if it is significant, it goes to the fifth step. If it is not significant, it indicates the presence of mediating effects.

In the fifth step, compare the signs of $\alpha_1 \delta_2$ and δ_1 . If the signs are the same, it represents a partial mediation effect, and if they are different, it represents a masking effect.

5. Research Results

5.1. Baseline Regression Analysis

Table 2 shows the regression results for both models, columns (1) to (4) for the ordered probit model and columns (5) to (8) for the OLS model, with the aim of testing the stability of the results of the model runs in this paper [60]. From the table, it can be found that the significance levels and sign directions of the core explanatory variables (ecological environment satisfaction, absolute income, and relative income) are exactly the same, except for the difference in significance levels for the control variables religiosity and social

insurance. However, considering that this is not related to the core variables, the results of this study can be considered to have a good robustness. The following section contains a specific analysis of the regression results.

Table 2. Baseline regression result.

Variables	Residents' Happiness (Ordered Probit)				Residents' Happiness (OLS)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
environment	0.126 *** (7.20)				0.080 *** (7.08)			
lnabsinc		0.059 *** (3.04)		0.043 ** (2.19)		0.037 *** (2.93)		0.027 ** (2.08)
relinc			0.177 *** (5.33)	0.165 *** (4.90)			0.114 *** (5.32)	0.107 *** (4.91)
age	−0.029 *** (−3.40)	−0.027 *** (−3.26)	−0.026 *** (−3.14)	−0.026 *** (−3.15)	−0.018 *** (−3.27)	−0.017 *** (−3.12)	−0.016 *** (−2.99)	−0.016 *** (−2.99)
age2	0.0003 *** (4.09)	0.0003 *** (4.00)	0.0003 *** (3.80)	0.0003 *** (3.84)	0.0002 *** (3.89)	0.0002 *** (3.80)	0.0002 *** (3.59)	0.0002 *** (3.63)
gender	−0.132 *** (−3.17)	−0.141 *** (−3.36)	−0.122 *** (−2.92)	−0.132 *** (−3.14)	−0.086 *** (−3.20)	−0.092 *** (−3.39)	−0.080 *** (−2.96)	−0.086 *** (−3.18)
marry	0.365 *** (5.36)	0.401 *** (5.91)	0.395 *** (5.81)	0.391 *** (5.76)	0.237 *** (5.34)	0.261 *** (5.86)	0.256 *** (5.76)	0.253 *** (5.70)
health	0.242 *** (10.86)	0.234 *** (10.40)	0.235 *** (10.55)	0.227 *** (10.07)	0.163 *** (11.48)	0.160 *** (11.02)	0.160 *** (11.17)	0.155 *** (10.69)
education	0.019 *** (3.43)	0.008 (1.34)	0.013 ** (2.28)	0.008 (1.28)	0.013 *** (3.71)	0.006 (1.64)	0.009 *** (2.59)	0.006 (1.60)
politic	0.101 (1.53)	0.101 (1.53)	0.110* (1.66)	0.100 (1.50)	0.045 (1.05)	0.045 (1.06)	0.051 (1.20)	0.045 (1.05)
religion	−0.128 * (−1.90)	−0.121 * (−1.80)	−0.111 * (−1.65)	−0.111 * (−1.65)	−0.068 (−1.58)	−0.065 (−1.49)	−0.059 (−1.35)	−0.058 (−1.35)
fair	0.227 *** (10.69)	0.250 *** (11.85)	0.242 *** (11.49)	0.246 *** (11.62)	0.156 *** (11.45)	0.172 *** (12.63)	0.166 *** (12.26)	0.168 *** (12.39)
trust	0.088 *** (4.23)	0.100 *** (4.81)	0.098 *** (4.72)	0.099 *** (4.76)	0.050 *** (3.67)	0.058 *** (4.24)	0.057 *** (4.18)	0.057 *** (4.22)
medical	0.071 (0.77)	0.059 (0.64)	0.042 (0.45)	0.047 (0.51)	0.069 (1.14)	0.062 (1.02)	0.050 (0.83)	0.054 (0.88)
endowment	0.107 ** (1.98)	0.092 * (1.70)	0.096 * (1.78)	0.087 (1.60)	0.072 ** (2.04)	0.063 * (1.76)	0.065 * (1.83)	0.059 * (1.66)
class	0.120 *** (9.09)	0.118 *** (8.81)	0.069 *** (4.11)	0.068 *** (4.02)	0.083 *** (9.84)	0.083 *** (9.53)	0.050 *** (4.59)	0.049 *** (4.50)
pseudo R ²	0.1076	0.1014	0.1042	0.1048	0.2211	0.2107	0.2157	0.2165
adjust R ²								
N	3095	3095	3095	3095	3095	3095	3095	3095

Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and robust standard errors are in parentheses below the regression coefficients.

Column (1) in Table 2 reflects the effect of residents' ecological environment satisfaction on their happiness. The results show that ecological environment satisfaction has a significant positive effect on residents' happiness. The reason is that residents have the most intuitive experience of their own surrounding ecological environment, and when the environment they live in becomes more beautiful and clean, the quality and comfort of living and working will be improved, which, in turn, will directly affect their happiness and quality of life. As General Secretary Xi Jinping emphasized during his visit to Elephant Trunk Hill Park in Guilin, Guangxi in 2021, "Where does the happiness of the people come from? It comes from a good living environment." Therefore, the more that residents are satisfied with the surrounding ecological environment, the higher the probability of feeling happiness themselves. This result verifies the first half of hypothesis 1.

Columns (2), (3), and (4) in Table 2 analyze the effect of income level on residents' happiness. The regression results in columns (2) and (3) demonstrate that both absolute and relative income have a significant positive impact on residents' happiness, indicating that the higher the absolute and relative income of residents, the more likely they are to feel happy. The estimation results in column (4) show that the positive correlation between absolute income and residents' happiness weakens after controlling for both absolute and

relative income, indicating that the effect of absolute income on residents' happiness is reduced when considering relative income, which primarily affects residents' happiness. In comparison to absolute income, relative income can better represent the fairness and equity of income distribution and is more relevant to the "not suffering from scarcity but suffering from unevenness" characteristic. People tend to care more about the latter, which is consistent with the social comparison theory. These results confirm hypothesis 2.

5.2. Marginal Effect Analysis

As the regression coefficients in the ordered probit model do not provide a clear economic interpretation, it is necessary to calculate the marginal effects to determine the degree of impact of each variable on residents' happiness. Table 3 presents the results of these calculations.

Table 3. Marginal effect result.

Variables	Residents' Happiness				
	H = 1	H = 2	H = 3	H = 4	H = 5
environment	−0.004 *** (−5.33)	−0.012 *** (−6.63)	−0.015 *** (−6.95)	0.003 *** (2.58)	0.028 *** (7.07)
lnabsinc	−0.002 ** (−2.48)	−0.005 ** (−2.59)	−0.006 ** (−2.60)	0.001 * (1.90)	0.012 ** (2.61)
relinc	−0.005 *** (−4.03)	−0.015 *** (−4.51)	−0.019 *** (−4.61)	0.003 ** (2.36)	0.036 *** (4.65)
control	YES	YES	YES	YES	YES
N	3095	3095	3095	3095	3095

Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and robust standard errors are in parentheses below the regression coefficients.

From the results of marginal effects, ecological environment satisfaction, absolute income, and relative income significantly contribute to the increase of residents' happiness, which is the same as the above conclusion. The specific degree of impact is that for every one-unit increase in the residents' ecological environment satisfaction, the residents' self-evaluation of "very unhappy" and "relatively unhappy" will decrease by 0.4% and 1.2%, respectively, and the probability of self-evaluation of "relatively happy" and "very happy" will be increased by 0.3% and 2.8%, respectively. For each unit increase in absolute and relative income, the probability of self-rating "very unhappy" and "relatively unhappy" will decrease by 0.2% and 0.5% and 0.5% and 1.5%, respectively, while the probability of self-rating "relatively happy" and "very happy" will increase by 0.3% and 2.8%, respectively, while "relatively happy" and "very happy" will increase by 0.1% and 0.3% and 1.2% and 3.6%, respectively.

5.3. Subgroup Regression Analysis

The previous study has demonstrated that ecological environment satisfaction has a significant positive effect on residents' happiness, but it remains to be seen whether this effect varies between urban and rural areas and different regions. To further explore this, the paper conducts group regressions on the sample residents from both urban–rural and regional perspectives. The results in Table 4 align with the theoretical expectations, indicating that there is no heterogeneity in the effect of ecological environment satisfaction on residents' happiness across regions and between urban and rural residents, with all showing significant positive effects. Therefore, hypothesis 1 is confirmed.

Table 4. Regression result for subgroups.

Variables	Urban and Rural		Region	
	Urban	Rural	East	Central and Western
environment	0.068 ** (2.53)	0.172 *** (7.25)	0.106 *** (4.31)	0.160 *** (6.23)
lnabsinc	0.072 * (1.83)	0.031 (1.24)	0.040 (1.21)	0.018 (0.66)
relinc	0.201 *** (3.60)	0.134 *** (3.14)	0.140 *** (2.83)	0.181 *** (3.87)
control	NO	YES	YES	YES
pseudo R ²	0.1140	0.1068	0.0942	0.1194
N	1274	1821	1457	1638

Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and robust standard errors are in parentheses below the regression coefficients.

5.4. Endogeneity Discussion

The micro data used in this study are derived from respondents' answers to the 2017 Chinese General Social Survey (CGSS) questionnaire. The core explanatory variable, ecological environment satisfaction, is a subjective evaluation by respondents of their environment, and may have a reciprocal causal relationship with the dependent variable, residents' happiness, which is also a subjective evaluation. Specifically, the assessment of happiness can be influenced by the subjective evaluation of one's ecological environment, which, in turn, can be influenced by one's subjective happiness [61]. This endogeneity issue may result in biased regression results. To address endogeneity issues, instrumental variable methods, such as two-stage least squares (2SLS), are commonly used. However, since both the ecological environment satisfaction and residents' happiness are discrete variables, using continuous variable 2SLS may not be suitable [62]. Therefore, drawing on existing research [63], we employ the IV-Oprobit model-based instrumental variable approach to address the endogeneity issue, using the average ecological environment satisfaction of the respondent's region excluding itself, as the instrumental variable. The two-stage regression equation can be written as:

$$environment_i = \theta_0 + \theta_1 aug_environment + \theta_2 control_i + \varepsilon_i \quad (8)$$

$$Happiness_i = \tau_0 + \tau_1 \widehat{environment}_i + \tau_2 control_i + \varepsilon_i \quad (9)$$

Equation (8) is the first stage estimator; *aug_environment* denotes average ecological environment satisfaction of the respondent's region excluding itself. Equation (9) is the second stage estimator, which is the same as Equation (1) except that the explanatory variable is the fitted value of ecological environment satisfaction.

The results are presented in Table 5, where column (1) shows that when controlling for ecological environment satisfaction and other variables, the estimates of average ecological environment satisfaction of other local residents on residents' happiness are not significant, indicating that the instrumental variables are exogenous. Columns (2) and (3) show the results of the estimation of instrumental variables. The estimation results from column (2) show that the average ecological satisfaction of other local residents has a significant positive effect on the ecological satisfaction of this resident, confirming that the instrumental variable is valid. The estimation results in column (3) show that ecological environment satisfaction significantly enhances residents' happiness, and the absolute value of the coefficient is larger than that estimated in the baseline regression. This indicates that residents' ecological environment satisfaction does enhance their happiness, and the effect of ecological environment satisfaction on happiness is strengthened after overcoming the endogeneity problem.

Table 5. Endogeneity test.

Variables	Happiness (1)	1st Stage (2)	2nd Stage (3)
		Environment	Happiness
aug_environment	0.151 (1.94)	0.678 *** (8.69)	
environment	0.131 *** (7.38)		0.133 *** (7.74)
control	YES	YES	YES
adjust R ² /Pseudo R ²	0.1050	0.0968	0.2163
N	3094	3094	3094

Note: *** indicates statistical significance at the 1% level, and robust standard errors are in parentheses below the regression coefficients.

5.5. Moderating Effect Test

Table 6 shows the results of the test of the effect of whether income level can moderate the effect of ecological environment satisfaction on residents' happiness; specifically, the interaction term between ecological environment satisfaction and income level was introduced into the model for analysis, and the results of the three models are given, with the purpose of being used to test the stability and reliability of the results [60]. It can be observed that the regression results obtained using the ordered probit model, ordered logit model, and OLS model, in this paper, exhibit the same direction and significance of the influence of the core explanatory variables on residents' happiness, indicating a good robustness of the results. The following section provides a detailed analysis of the results of the moderating effect test.

Table 6. Test result for moderating effect.

Variables	Ordered Probit		Ordered Logit		OLS	
	(1)	(2)	(3)	(4)	(5)	(6)
environment	0.133 *** (7.52)	0.116 *** (6.55)	0.240 *** (7.46)	0.208 *** (6.49)	0.086 *** (7.52)	0.073 *** (6.45)
lnabsinc	0.206 *** (3.57)		0.393 *** (3.78)		0.164 *** (4.33)	
interaction1	−0.033 ** (−2.56)		−0.064 *** (−2.74)		−0.029 *** (−3.43)	
relinc		0.419 *** (4.81)		0.792 *** (5.00)		0.349 *** (6.20)
interaction2		−0.059 *** (−3.07)		−0.112 *** (−3.20)		−0.057 *** (−4.59)
control	YES	YES	YES	YES	YES	YES
pseudo R ²	0.1078	0.1103	0.1062	0.1089		
adjust R ²					0.2228	0.2290
N	3095	3095	3095	3095	3095	3095

Note: Interaction1 denotes the interaction term between ecological environment satisfaction and absolute income, and interaction2 denotes the interaction term between ecological environment satisfaction and relative income. ***, and ** indicate statistical significance at the 1%, and 5% levels, respectively, and robust standard errors are in parentheses below the regression coefficients.

The results in column (1) of Table 6 show that after controlling for other variables, both ecological environment satisfaction and absolute income have a significant positive effect on residents' happiness. However, the coefficient of the interaction term between ecological environment satisfaction and absolute income is significantly negative, indicating that absolute income plays a moderating role in the effect of ecological environment satisfaction on residents' happiness, which shows that an increase in residents' absolute income will weaken the effect of ecological environment satisfaction. The coefficient of the interaction term is significant and negative. The possible reason for the large difference in the effect

of ecological environment quality on residents' happiness with different incomes is that residents with higher incomes have been greatly satisfied with their material life and want to pursue a higher standard of happiness, so the marginal utility of the positive effect of ecological environment satisfaction on residents' happiness is also decreasing with the increase of income. The results of column (2) are similar to column (1), with the difference that the significance of the coefficient of the interaction term of column (2) is stronger than that of column (1), which further verifies the conclusion that residents pay more attention to relative income. The above results indicate that hypothesis 3 passes the test.

5.6. Mediating Effect Test

The results of the previous analysis show that ecological environment satisfaction has a significant positive effect on residents' happiness, and absolute income has a significant positive effect on residents' happiness. According to the environmental value theory, higher ecological environment satisfaction means higher ecological environment quality, and higher ecological environment quality will attract enterprises to invest, increase jobs, and raise the absolute income of local residents. In this paper, regression analysis was conducted using the test of Wen and Ye [59], and the specific results are shown in Table 7.

Table 7. Test result for mediating effect.

Variables	Residents' Happiness	lnabsinc	Residents' Happiness
	(1)	(2)	(3)
environment	0.126 *** (7.13)	0.055 *** (3.54)	0.129 *** (7.37)
lnabsinc			0.068 *** (3.49)
control	YES	YES	YES
pseudo R ²	0.1051	0.0665	0.1063
N	3095	3095	3095

Note: *** indicates statistical significance at the 1% level, and robust standard errors are in parentheses below the regression coefficients.

The coefficient of column (1) ecological environment satisfaction was found to be significantly positive through the first step of the test, which can be described using the mediating effect. The coefficient of column (2), ecological environment satisfaction, and the coefficient of column (3), absolute income, were found to be significantly positive through the second step of the test, which has a significant indirect effect, and the fourth step was conducted. The fourth step of the test found that the coefficient of column (3) ecological environment satisfaction is significantly positive and has a significant direct effect, which requires the fifth step of the test to determine. Through the fifth step of the test, it is found that the signs of $\alpha_1\delta_2$ and δ_1 are the same, indicating that there is a partial mediating effect of absolute income in the process of ecological environment satisfaction affecting the happiness of residents. Therefore, hypothesis 4 passes the test.

6. Conclusions

6.1. Research Conclusions

In the new development stage, the coordinated development of ecological environmental protection and economy is an important way to meet people's aspirations for a better life and enhance residents' happiness and sense of achievement. This paper investigates the influence of ecological environment satisfaction and income level on residents' happiness by using the survey data of CGSS 2017.

The main conclusions of this study are as follows: (1) The improvement of ecological environment satisfaction is beneficial to residents' happiness, and there is no urban–rural and regional heterogeneity in this positive effect. (2) Both absolute income and relative income have a significant positive effect on residents' happiness, and the relative income

has a higher degree of positive effect on residents' happiness than the absolute income, which is consistent with the results of previous studies [64,65]. (3) Income level has a moderating effect on residents' happiness in the process of ecological environment satisfaction; specifically, the increase of residents' income level will weaken the effect of ecological environment satisfaction on their happiness. (4) Absolute income has a mediating effect in the process of eco-environmental satisfaction affecting residents' happiness, i.e., eco-environmental satisfaction can affect residents' happiness by influencing their absolute income, which is consistent with the development concept of "Lucid Waters and Lush Mountains are Invaluable Assets" [66].

6.2. Policy Implications

Firstly, protecting the ecological environment is crucial for the development and the well-being of residents, regardless of whether they live in urban or rural areas. Damaging the environment negatively affects residents' happiness. Therefore, the government should prioritize ecological environmental protection and understand the relationship between environmental protection and economic development. Pursuing high-quality development that improves both the environment and residents' income is crucial.

Secondly, residents' happiness is more affected by their relative income than their absolute income. To increase residents' income and promote a fair distribution system, the government should increase labor remuneration and use taxation and social security to redistribute income. It should also regulate the order of income distribution to promote fairness and reduce income disparities between urban and rural areas. These policies will enhance residents' happiness, promote social harmony, and create shared prosperity.

Thirdly, investing in the ecological environment has a greater impact on the happiness of residents in less developed areas compared to economically developed areas, where the positive effect of residents' satisfaction with the environment on their happiness decreases with income level. To improve happiness in low-income areas, the government should increase investment in ecological protection through multi-funding, which can enhance the quality of the environment and improve residents' happiness.

Fourthly, to practice the development concept of "Lucid Waters and Lush Mountains are Invaluable Assets", the government should take measures based on the ecological environment conditions of different areas. For areas with poor ecological environment, the government should increase investment in ecological construction and protection, establish reserves, and implement restoration and afforestation projects. For areas with better ecological environment, the government can provide subsidies and incentives to promote environmental protection industries and reduce pollutant emissions.

7. Research Limitations and Prospects

The survey data used in this paper has a certain degree of lag. Despite using the latest data from 2017, various important changes and events have occurred in China since then, which have had significant impacts on the economy, environment, and culture. Hence, to analyze the research subjects more accurately, it is crucial to take into account the effects of these changes, and conduct field research in subsequent studies to obtain more timely, comprehensive, and realistic data, thereby enhancing the timeliness of the research findings.

This paper is based on cross-sectional data, which can only provide a snapshot of data at a single point in time and may not capture the dynamics of changes over time, nor the potential influence of the omitted variables. Alternatively, panel data could partially address these limitations. By collecting observations of multiple units at various time points, panel data can capture the trends and relative differences of data changes over time and better control the influence of omitted variables, leading to more accurate and reliable research findings.

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