Adaptation of Tourism Transformation in Rural Areas under the Background of Regime Shift: A Social–Ecological Systems Framework

Jia Chen 1,2,*, Wenqian Chen 1, Fei Wang 1 and Mengqi Deng 1

1 College of Urban and Environmental Sciences, Northwest University, Xue Fu Ave.1, Xi’an 710127, China
2 Shaanxi Key Laboratory of Earth Surface System and Environmental Carrying Capacity, Northwest University, Xi’an 710127, China
* Correspondence: chenjia2018@nwu.edu.cn

Abstract: The rural transformation driven by regime shift is obvious around the world, and there is still insufficient research exploring related effective analytical frameworks and ideas. Transformation adaptation is widely used in the field of disaster research as a concept of dynamic systems’ evolutionary development, emphasizing fundamental changes in the structure or function of systems and promoting equity and justice for communities in social–ecological systems. This paper critically reviews and synthesizes the literature on adaptation to construct an evaluation framework of transformative adaptation of social–ecological systems. This framework is applied to the analysis of the adaptive process, capacity, and outcomes of rural tourism transformation in different cases of Shaanxi Province, China. The results were as follows: (1) The shift of regime state in the process of rural transformation adaptation has diversified, while the tourism regime shift with active adaptation has better adaptive capacity and outcomes; (2) a strong community foundation and benefit-sharing tourism development model can promote adaptation in the rural system; and (3) social relationship networks, farmers’ collective interests and discourse power, and rural economic and material conditions are the key factors affecting the adaptation of rural tourism transformation. This study provides practical analytical tools and opportunities for improving adaptation of the rural tourism transformation at the global level.

Keywords: adaptation; tourism; rural areas; regime shift; social–ecological systems

1. Introduction

Global changes and urbanization, land degradation, resource shortages, aging populations, and population outflow have aggravated the instability and vulnerability of the development of many rural areas [1,2], resulting in a wide range of socioeconomic problems, e.g., rural recession, poverty, and social inequality [3,4]. Addressing such issues is now the primary focus of global rural sustainable development. Notably, rural areas in developing countries and underdeveloped regions are most at risk due to a lack of coping resources and transformative capacity. At present, the development of leisure tourism has become one of the key ways to achieve rural transformation in many underdeveloped areas and countries [5,6]. Tourism development generally has a positive impact on the system elements of rural areas, especially the increase in rural incomes and infrastructure improvements [7]. However, increasingly more studies and practices have shown that the transformation from traditional agricultural villages to tourism and leisure villages induces a series of ecological environment destruction and new social contradictions [7,8]. To cope with the challenges of rural development brought about by the increasingly uncertain external environment, transformation adaptation has become one of the important routes to achieving rural sustainable development.
The main external driving forces of rural transformation are global changes, urbanization, and marketization [9]. However, for a long time, compared with the central and eastern regions, Western China has generally lower urbanization rates, lagging social and economic development, and rural transformation is clearly guided by national policies and institutions [10,11]. Since 1978, China has implemented a household contract responsibility system and reformed the market economy system, thereby reshaping the main body of production and operation and promoting the vitality of the market-oriented economy in China’s rural areas. Since the beginning of the 21st century, the government of China has issued 16 No.1 documents, which comprehensively focus on supporting rural work in China and promoting the new rural construction [12]. In 2017, the rural revitalization strategy raised the issue of agriculture, rural areas, and rural people to a national strategic level for the first time and promoted priority development of agriculture and rural areas through policy and institutional innovation [13]. The influence of institutional change consequently promoted the transformation of a large number of traditional agricultural villages in China. As one of the crucial elements of the “rural revitalization strategy”, rural tourism development in China has now experienced breakthroughs in rural transformation and eliminating poverty in Western China. However, the 2016 report on China’s rural tourism development index issued by the Chinese Academy of Social Sciences pointed out that at the present stage, investment in the development of tourism transformation in rural China has overheated. The homogeneity phenomenon of rural tourism development projects is comparatively serious [14,15], and a lot of projects’ failures in market competition have caused the waste of rural resources. Moreover, there are problems, e.g., the destruction of the natural environment, the increase in the gap between rich and poor, and cultural conflict in tourism villages [15–18].

For rural communities in other developing countries around the world, tourism development challenges their traditional knowledge and understanding of the world. Backward socioeconomic conditions and a lack of the requisite skills and knowledge needed to successfully engage in tourism [19], coupled with limited resident access to the information needed to effectively participate in tourism planning and management [20,21], lead to problems similar to those seen in China’s rural tourism transformation. There is a close relationship between “rural tourism” and “poverty reduction” in developing countries, while the tourism industry needs to invest significant financial resources and time to generate income. It is difficult to satisfy stakeholders in the short term based on tourism transformation with the goal of “poverty eradication” [22], which results in maladaptation of tourism transformation and increasingly negative impacts on rural systems. Therefore, it is urgent to explore effective adaptation paths and modes of traditional agricultural villages in developing countries to avoid the negative effects of rural transformation adaptation.

Institutional changes in the management of rural land, economy, and society promote the rural transformation [23]. Moreover, the adaptive cycle theory of social–ecological systems (SESs) emphasizes that regime shift is an important concept of systematic state change [24]. Therefore, we regard rural communities as complex, self-adapting social–ecological systems whose natural, social, and environmental transformations are caused by institutional changes as uncertain disturbances. After rural transformation, the regime states are taken as adaptive strategies to deal with these disturbances. We take three villages with tourism development in Shaanxi Province in Western China as examples. This study aims to clarify the adaptation process of rural transformation under regime shift and define the rural regime status under different adaptation processes. Next, a comparative analysis is conducted to examine the rural adaptive capacity and outcomes under tourism transformation. Finally, we explore the factors that generate varying adaptive outcomes of rural transformation and make recommendations for rural adaptation and sustainable development in the global transition period. The research contributes in two ways: first, it contributes to the establishment of a new theoretical system for sustainable development and transformation adaptation of social–ecological systems (SESs); secondly, it provides a
2. Literature Review and Analysis Framework

Since 1990, the study of social–ecological systems has become a focus of sustainable science in the field of global change. Nowadays, there are numerous studies on adaptation research. However, the majority of the extant literature focuses on coping and adaptation strategies associated with disasters, climate change, and environmental change risks in the field of natural science [25–29]. In the context of adaptation to climate change, the transition to sustainable tourism is widely discussed internationally [30,31]. Although studies on the adaptation of tourism development have been conducted for quite a long time, they mostly center on climate change or disaster risk [32–35], and there is a paucity of studies on the adaptations associated with cultural and social risk factors, particularly the rural adaptation under institutional change. The adaptation theory framework includes the adaptive object and subject, the adaptive process, the dynamic change in the adaptive capacity, etc. [26,36,37]. However, the present research prioritizes the static state of regional and community adaptation, farmers’ livelihood adaptation strategies, and adaptive capacity analysis [38–41]. In contrast, relatively few studies have examined the adaptation process and evaluated the adaptive capacity changes in rural system transformation, which are limited by the vulnerability and resilience analysis framework. System adaptation is a process variable, and system adaptation has a cumulative effect [42]. Therefore, it is of great practical significance and theoretical value to analyze the transformation adaptation of systems to explain the elemental changes and mechanisms of social–ecological systems.

Due to the late start of independent adaptation research, the existing literature employs vulnerability and resilience thinking methods to conduct adaptation research. Accordingly, the adaptation (adaptive capacity) is closely related to the concepts of vulnerability and resilience [26,43]. Under the framework of vulnerability research, adaptation is an internal system attribute representing its coping ability via internal adaptation and adjustment in the face of external risk interference [44]. Under the theoretical framework, adaptation is the dynamic adjustment and coping strategy [45] of an agent to reduce exposure risks and subject sensitivity, which are part of system vulnerability [46]. Under the framework of resilience research, adaptation is the core feature of a resilient social–ecological systems. From a dynamic perspective, adaptation research focuses on the systems-based analysis, explores the implications of adaptive processes on the rest of the system, and emphasizes the coupling of social–ecological systems [42]. Notably, adaptive behavior affects not only the expected stakeholders but also the temporal evolution of the system. Therefore, it seems plausible that past adaptation strategies affect the current adaptation selection range and adaptive capacity and that decisions in the present will affect future system uncertainty.

Therefore, the biggest difference in adaptation research between the vulnerability and resilience frameworks lies in the research logic: while the framework of vulnerability research is agent-oriented and centers on the process of agents making adjustments and decisions, the resilience framework is system-oriented analysis, focusing on the system’s adaptive capacity and how to maintain it to cope with future uncertainties. Agent-oriented research focuses on behavior patterns, ignoring the dynamic change inherent in the interconnected social–ecological systems. Although system-oriented analysis emphasizes a holistic view of the system, it pays insufficient attention to adapting to subjects’ behavioral adjustment and does not match the dynamic change process. Therefore, the logic paradigm of adaptation analysis based on a single vulnerability or resilience framework has its own advantages and disadvantages [8].

Accordingly, this study combines the agent-oriented and system-oriented adaptation analyses. On the one hand, it analyzes the adaptation process of rural systems from the agent-oriented perspective, which follows the logic of adaptation subject → adaptation object → adaptation process (strategy). On the other hand, it emphasizes the analysis of adaptive structural elements, namely, the thinking of adaptive strategy → adaptive
capacity → adaptive outcome, so as to construct the adaptation analysis framework of social–ecological systems transformation (see Figure 1).

![Figure 1. Adaptation assessment framework of social–ecological systems transformation.](image)

In this framework, the subject of adaptation is the rural social–ecological systems, and the object of adaptation is changing the natural environment and regime shift, such as tourism development, land policy reform, ecological deterioration, etc. Adaptive capacity is the ability of social–ecological systems to respond or adjust to reduce vulnerability and adverse impacts by adjusting system structure or behavior to adapt to external risks and pressures. Adaptedness refers to the adaptive outcome (effects) produced by the social–ecological system itself due to the differences in adaptive capacity under different adaptation strategies. When faced with external risk disturbance, the system will devise a transformation adaptation strategy to change to a new system structure or maintain the original system state. As an inherent attribute of the social–ecological systems, adaptive capacity will show a corresponding capacity according to regime shift that will produce different adaptive outcomes (effects). The process of rural transformation adaptation is presented as a system adaptation cycle from the dynamic perspective. Thereafter, a series of adaptive strategy changes (regime shift) form different system states, and the adaptive capacity of SES produces differentiated adaptive outcomes. Meanwhile, the new adaptive capacity of the system accumulates, thus influencing the selection of adaptive strategies in the next stage.

The framework represents social–ecological systems’ transformation in terms of incremental adjustment or regime shift/transformation [42], which indicates regime change (or a new regime state) in a system. Among them, regime shift refers to the process in which the system crosses the threshold and produces a new social–ecological system. This paper defines the new social–ecological system as a new system regime. The premise of regime shift is to cross the threshold of the ecosystem or social system and enter a new system state. While the incremental adjustment is such that the system does not cross the critical value and maintains the current system regimes, the internal attributes or elements of the system have changed. The adaptive capacity index systems of SESs were constructed from the two dimensions of social system and ecosystem capacity. Holtz et al. (2008) developed five defining characteristics of regimes and argued that purpose [47], stability, and coherence are important characteristics of social–ecological system regimes (states), and are important variables that reflect the attributes and changes of system states. We follow Holtz to measure the adaptive outcomes of social–ecological systems’ transformation by using the three elements of purpose, stability, and coherence.

In general, the technical route of this study is as follows: firstly, qualitative and quantitative methods are used to determine the transformation of the regime state of rural social–ecological systems; then, the adaptive capacity and adaptive outcome are evaluated.
by constructing an indicator system. Finally, the regression analysis method is used to identify the influencing factors of the adaptation outcome, so as to reveal the internal logical relationship and influencing effect of the adaptability of tourism transformation in rural social-ecological systems under the regime shift.

3. Materials and Methods

3.1. Cases and Data

We carried out fieldwork in three communities in Shaanxi Province, China (see Figure 2). The rural communities of the three cases are located in poverty-stricken mountainous areas, traditional agricultural plain areas, and piedmont areas abounding with cash crops. There are clear differences in the adaptation process of rural tourism transformation in these three areas. A comparative study is helpful to explore the adaptation state and effects of rural transformation under different regime shift paths.

![Figure 2. Location map of the study area.](image)

Zhujiawan Village is located in the Qinling Mountains of Shaanxi Province, China, 58 km away from the central city-Xi’an. Provincial highways and national highways pass through the village, bringing convenient transportation. More than 90% of the region is forested, and plant resources are abundant [48]. However, the region is located in mountainous areas and the farmlands are scarce, resulting in the traditional agricultural products planting industry being underdeveloped. Due to its relatively high altitude, it is cool in summer, making it a good choice for a summer vacation. Yuanjia Village is situated in the northwest of Guanzhong Plain, Shaanxi Province, China, with rich land resources and superior conditions for traditional agricultural development. It is only 10 km away from Zhaoling, a cultural site and scenic spot in the Tang dynasty, and approximately 80 km distance from the central city of Xi’an [48]. Yuanjia Village has a convenient traffic infrastructure owing its close proximity to the national trunk highway, national expressway, and the city ring road. Zhaodai Village is located in Zouzhi County, Shaanxi Province, China. The primary local economic crop is kiwifruit, which is a specialty fruit industry.
The eastern side of the village is approximately 70 km away from Xi’an. The city ring road passes through this area, offering convenient transportation. Zhaodai Village is adjacent to the LouGuanTai Taoist culture exhibition area, for which a scenic area of 29.38 square kilometers is planned [48].

Data were collected from questionnaires, in-depth interviews, and text data. Quantitative and qualitative data were collected at the household and community levels. At the household level, due to the large number of migrant workers in the three survey sites, the survey could not cover the overall sample size, so the random sampling method was used to ensure that all samples were included with equal probability as far as possible. At the community level, in-depth interviews with key people were used to obtain more in-depth information on rural development and the transformation process. First, the basic data of the Yuanjia and Zhaodai villages were obtained from a questionnaire distributed to peasant households and in-depth interviews with village cadres that took place in October 2013 and December 2014. The contents of the survey mainly included the basic situation of rural households, livelihood strategies, changes in livelihood capitals (such as financial, human, material, natural and social capital, etc.), and farmers’ perception of tourism development, such as the impact of tourism development on rural ecological environment, economic income, institutional management, infrastructure, etc. A total of 36 and 31 valid questionnaires were obtained for Yuanjia Village and Zhaodai Village, respectively. Second, for Zhujiawan Village, the research team conducted a questionnaire survey in July 2018. A total of 140 questionnaires were distributed and 135 were effectively recovered (including nine interview records), with an effective rate of 96%. Finally, in November 2018, a unified field survey and in-depth interviews were conducted in the three case villages to supplement and update the research data. In-depth interviews were conducted with village cadres and farmers who had worked in the villages, and six interviews were recorded. The interview content mainly included three aspects. First, aiming at the regime and policy changes of rural development, the questions involved the strategies and characteristics of rural social and economic development under the national regime in different periods of the case villages. Second, for the livelihood of rural households, the questions mainly involved the livelihood strategies that have been adopted by rural households in different periods of rural transformation and development, and their livelihood status. Third, for the development process of rural tourism, this aspect involved questions such as why rural areas are implementing tourism development, what the opportunities and challenges of tourism development are, what the process of tourism resource development, the main body, and the mode of operation and management are, etc. Each family questionnaire survey took approximately 30 min to complete and the interviews lasted more than 1 h.

3.2. Indicators Measuring Adaptation
3.2.1. Adaptive Capacity Indicators

In the field of social–ecological systems research, adaptive capacity refers to the ability of farmers or rural communities to self-adapt and maintain stability when experiencing external disturbances and to take advantage of new opportunities to cope with various disturbances, e.g., climate impacts and policy interventions [44]. Adaptive capacity is the result of the interaction of different variables. As for the quantification of adaptive capacity in a social system, previous scholars (e.g., Eakin and Lemos, 2006) proposed a variety of quantitative indicators, including material (infrastructure, material wealth, and technology) and social/institutional (human capital, policy rationality, and institutional strength) factors [49]. Smit and Pilifosova (2001) outlined six categories of decisive factors of adaptive capacity: economy, technology, information and skills, infrastructure, institutional management, and fairness [50]. On this basis, subsequent scholars have proposed a corresponding index system of adaptive capacity assessment in studies of different scales and backgrounds [28,51]. Adaptation studies of rural tourism destinations mostly construct adaptive capacity indicator systems from the natural, financial, material, human, and social dimensions [52–54]. Accordingly, on the basis of revising the existing adaptive capacity
indicator system of rural communities, we constructed an original indicator system of adaptive capacity for rural communities in the process of tourism transformation (see Table 1).

### Table 1. Adaptive capacity indicators.

<table>
<thead>
<tr>
<th>Subsystem</th>
<th>Indicator</th>
<th>Description and Definition</th>
<th>Reference Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social system</strong></td>
<td>Employment rate</td>
<td>Ratio of the number of people employed in the labor force to the total labor force</td>
<td>[55]</td>
</tr>
<tr>
<td></td>
<td>Level of participation in tourism</td>
<td>Number of family members participating in tourism operation</td>
<td>[52]</td>
</tr>
<tr>
<td></td>
<td>Per capita income</td>
<td>Ratio of total income to total population</td>
<td>[56]</td>
</tr>
<tr>
<td></td>
<td>Material assets</td>
<td>Number of types of material assets per household</td>
<td>[53]</td>
</tr>
<tr>
<td></td>
<td>Labor force quality</td>
<td>Education level of the labor force</td>
<td>[56]</td>
</tr>
<tr>
<td></td>
<td>Dependency ratio</td>
<td>Ratio of nonlabor to labor force</td>
<td>[57]</td>
</tr>
<tr>
<td></td>
<td>Policies support</td>
<td>Number of technical trainings per household</td>
<td>[58]</td>
</tr>
<tr>
<td></td>
<td>Social connectedness</td>
<td>Number of people per household who can borrow money</td>
<td>[52]</td>
</tr>
<tr>
<td></td>
<td>Neighborhood atmosphere</td>
<td>1 = very bad, 2 = bad, 3 = average, 4 = good, 5 = very good</td>
<td>[52]</td>
</tr>
<tr>
<td></td>
<td>Infrastructure</td>
<td>Number of schools, health centers, and other forms of infrastructure in the community</td>
<td>[57]</td>
</tr>
<tr>
<td></td>
<td>Traffic accessibility</td>
<td>1 = very bad, 2 = bad, 3 = average, 4 = good, 5 = very good</td>
<td>[59]</td>
</tr>
<tr>
<td></td>
<td>Housing area</td>
<td>Average housing area of per household (m²)</td>
<td>[52]</td>
</tr>
<tr>
<td></td>
<td>Housing types</td>
<td>0 = civil building, 0.25 = wood and brick building, 0.5 = clay and brick building, 0.75 = brick building, 1 = brick and concrete building</td>
<td>[52]</td>
</tr>
<tr>
<td></td>
<td>Institutional flexibility</td>
<td>1 = very rigid, 2 = rigid, 3 = average, 4 = flexible; 5 = very flexible</td>
<td>[60]</td>
</tr>
<tr>
<td></td>
<td>Residents’ discursive power</td>
<td>1 = no voice, 2 = some voice, 3 = average, 4 = majority, 5 = completely dominant</td>
<td>[61]</td>
</tr>
<tr>
<td><strong>Ecological system</strong></td>
<td>Noise pollution</td>
<td>1 = severe contamination, 2 = little pollution; 3 = no change (or unknown), 4 = no pollution, 5 = improvement in pollution</td>
<td>[54]</td>
</tr>
<tr>
<td></td>
<td>Environmental sanitation facilities</td>
<td>1 = very bad, 2 = bad, 3 = generally, 4 = good, 5 = very good</td>
<td>[49]</td>
</tr>
<tr>
<td></td>
<td>Water quality</td>
<td>1 = severe contamination, 2 = little pollution; 3 = no change (or unknown), 4 = no pollution, 5 = improvement in pollution</td>
<td>[54]</td>
</tr>
<tr>
<td></td>
<td>Air quality</td>
<td>1 = severe contamination, 2 = little pollution, 3 = no change (or unknown), 4 = no pollution, 5 = improvement in pollution</td>
<td>[54]</td>
</tr>
</tbody>
</table>

Due to the large number of indicators, we adopt principal component analysis (PCA) to simplify the original indicator system. Among them, the Kaiser–Meyer–Olkin (KOM) test and Bartlett tests (KOM-0.583, LR-458.923, Sig-0.00) show that PCA is an acceptable approach. According to the PCA results, the cumulative variance contribution rate (71.323%) indicated that the extracted principal components had strong explanatory power. After the indicators with small variance contribution were removed, and following the indicator framework proposed by Smit and Pilifosova (2001) [50], the new adaptive capacity indicator system and weights were obtained by grouping them into six dimensions: economy, labor force, social environment, housing, management, and ecological environment (Table 2).

In Table 2, the economic and housing dimensions reflect the community’s economic attraction and the extent of financial and material resources accumulated to adapt to an external disturbance. The labor force dimension represents the human resources (conditions) available to the community to cope with an external disturbance. In the social environment dimension, social connectedness and neighborhood atmosphere reflect the community’s humanistic emotional relationships. Infrastructure and traffic accessibility reflect the facilities available to the system when facing risk interference. The management dimension reflects the flexibility and fairness of community management. Finally, the
The ecological dimension reflects the adaptation measures of environment condition changes under the system transformation.

### Table 2. Adaptive capacity indicators by principle component analysis.

<table>
<thead>
<tr>
<th>Subsystem</th>
<th>Dimension</th>
<th>Indicator</th>
<th>Factor Loading</th>
<th>Variance Contribution</th>
<th>Index Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic</td>
<td></td>
<td>Employment rate</td>
<td>0.528</td>
<td>0.448</td>
<td>0.020</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Per capita income</td>
<td>0.738</td>
<td>0.375</td>
<td>0.130</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Level of participation in tourism</td>
<td>0.554</td>
<td>0.300</td>
<td>0.199</td>
</tr>
<tr>
<td>Labor force</td>
<td></td>
<td>Labor force quality</td>
<td>0.634</td>
<td>0.444</td>
<td>0.018</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dependency ratio</td>
<td>0.616</td>
<td>0.588</td>
<td>0.302</td>
</tr>
<tr>
<td>Social environment</td>
<td></td>
<td>Social connectedness</td>
<td>0.496</td>
<td>0.385</td>
<td>0.101</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Neighborhood atmosphere</td>
<td>0.424</td>
<td>0.334</td>
<td>0.014</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Infrastructure</td>
<td>−0.423</td>
<td>0.318</td>
<td>0.014</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Traffic accessibility</td>
<td>0.551</td>
<td>0.330</td>
<td>0.022</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Environmental sanitation facilities</td>
<td>0.526</td>
<td>0.350</td>
<td>0.018</td>
</tr>
<tr>
<td>House</td>
<td></td>
<td>Housing type</td>
<td>−0.632</td>
<td>0.648</td>
<td>0.015</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Housing area</td>
<td>0.571</td>
<td>0.526</td>
<td>0.045</td>
</tr>
<tr>
<td>Management</td>
<td></td>
<td>Residents’ discursive power</td>
<td>0.500</td>
<td>0.522</td>
<td>0.034</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Institutional flexibility</td>
<td>0.472</td>
<td>0.534</td>
<td>0.021</td>
</tr>
<tr>
<td>Ecological system</td>
<td>Ecological environment</td>
<td>Water quality</td>
<td>0.800</td>
<td>0.520</td>
<td>0.025</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Air quality</td>
<td>0.850</td>
<td>0.508</td>
<td>0.020</td>
</tr>
</tbody>
</table>

#### 3.2.2. Adaptive Outcome (Adaptedness) Indicators

Purpose, stability, and coherence are important characteristics of social–ecological systems regime (states) that reflect the characteristics of the system state and the possibility of change and are key variables for describing changes in system interactions [47]. They can also effectively characterize the adaptive outcomes of rural systems. Accordingly, for adaptive outcomes (adaptedness), we use three indexes: purpose (human settlements environment), stability (income diversity), and coherence (the gap between rich and poor) to explain the adaptive outcome of rural tourism transformation in the three cases. Among the three characteristics, purpose refers to the objective of SES regime development, as represented by the basic functional attributes that the development of social–ecological systems should meet [52]. In the rural community system, we use the human settlement environment to represent the functional purpose of the rural system. Stability is a form of dynamic stabilization in SES development [47]. It represents the stability of the community main body development in the rural system, that is, farmers can maintain stable livelihoods, as represented by income diversity. Finally, coherence denotes the consistency (equity) of development among the rural community main body [47], which is expressed by the indicator of the gap between rich and poor segments of the population.

#### 3.3. Quantitative Analysis

To eliminate the dimensional influence of the original survey data, range standardization was used to process it. The comprehensive index method was used to evaluate the adaptive capacity of a rural system, which is a commonly used mathematical method to calculate adaptive capacity [28]. The calculation formula is

\[ ACI = \sum w_i x_i \]  

where \( ACI \) is the adaptive capacity index of farmers, \( x_i \) is the standardized value of \( i \) indicators, and \( W_i \) is the weight of this indicator obtained from the PCA method. The scale
of this study is a rural community, so the average of all farmers’ adaptive capacity in the rural community is taken to represent the rural adaptive capacity:

\[ \text{ACI} = \frac{\sum_i w_i x_i}{n} \]  

(2)

where \( n \) is the number of farmers.

The basic assumption is that the rural adaptive outcomes have a linear relationship with their adaptive capacity. To carry out this analysis, we used the OLS model of multiple linear regression analysis to identify the factors influencing the adaptive outcomes. Models 1, 2, and 3 aim to determine the impact of adaptive capacity factors on the human settlement environment, income diversity, and the gap between rich and poor at the 5% probability level. The OLS model was specified as follows:

\[ E = \beta_0 + \beta_1 A_1 + \beta_2 A_2 + \beta_3 A_3 + \ldots + \beta_p A_p + \epsilon \]  

(3)

where \( E \) is a dependent variable (adaptive outcome indicators), \( \beta_0 \) is the constant, \( \beta_1, \beta_2, \ldots, \beta_p \) are regression coefficients, \( A_1, A_2, \ldots, A_p \) are the independent variables (adaptive capacity factor), and \( \epsilon \) is random error.

4. Results and Discussion

4.1. Rural Adaptive Process and Regime States

Nelson et al. (2007) and the European Environment Agency think that the adaptive process of social–ecological systems can be divided into incremental adjustment and regime shifts/transformation [42]. In order to clearly describe system regime shifts in the adaptive process of each study area, the ball–basin model was introduced [24], where the ball represents the rural system of the study area and the basin represents the regime state and system conditions (see Figure 3). We used a combination of qualitative and quantitative methods to define system regime shifts. First, farmers’ livelihood mode is the micro-subject behavior of rural adaptation and response to external disturbances; second, the core performance of the tourism transformation of a rural system represents the change in the rural industry. The proportion of tourism operation can better describe the state characteristics of a rural system under a tourism regime. Therefore, we used farmers’ leading livelihood mode and the proportion of tourism operation as system state variables to represent the shift of system regime states (Table 3).

Table 3. Regime states and variables of rural systems.

<table>
<thead>
<tr>
<th>System Regime</th>
<th>Regime State</th>
<th>State Variable Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R_1 (Agricultural)</td>
<td>S_1</td>
<td>100% traditional agricultural livelihoods</td>
</tr>
<tr>
<td></td>
<td>S_2</td>
<td>Dominated by traditional agricultural livelihoods ≥ 50% (working + cash crop planting)</td>
</tr>
<tr>
<td></td>
<td>S_3</td>
<td>Dominated by working ≥ 50% (grain crop + cash crop planting)</td>
</tr>
<tr>
<td>R_2 (Rural tourism)</td>
<td>R_2</td>
<td>Tourism operation proportion ≥ 30% and rural tourism is mainly developed</td>
</tr>
</tbody>
</table>

(1) Zhujiawan Village

Zhujiawan Village has experienced the shift from a traditional agricultural regime (R_1) to a rural tourism regime (R_2) (see Figure 3). From the period of collective economy (1950–1977) to 2012 is the traditional agricultural regime, during which the system experienced many institutional adjustments. During the period of collective economy, farmers in Zhujiawan Village largely relied on logging for their livelihoods. According to the logging indicators given by the nation, trees were collectively cut in groups and sold to lumber companies. The traditional agricultural regime based on logging (S_1) is an active adaptive
strategy for Zhujiawan Village to deal with the lack of cultivated land resources and take advantage of the rich forest resources in the Qinling mountainous area.

Figure 3. Regime shifts diagram of different villages (revised from Müller et al., 2014 [62]).

Since the establishment of a household contract responsibility system (1978), Zhujiawan Village has gradually been closed to logging, and the main livelihood activities of rural communities have shifted to the cultivation of traditional crops (potatoes, corn, and soybeans) (see Figure 4). The annual average household output is only 100–150 kg, making it difficult for families to ensure they have sufficient food to support their families. The survival rationality of farmers in rural communities led to the demand for increasing the annual grain yield, and they reclaimed a large number of hillsides to increase the planting area. However, in 1999, the Chinese government proposed the policy of “Grain for Green”. Some of the slopes in Zhujiawan Village were transformed into forest land (see Figure 4). By 2003, all sloped land was turned into forest due to this policy, and the arable land area of community farmers was minimized. The agricultural output could no longer support the farmers’ basic survival, which prompted a large number of farmers to work outside of farming to make a living. During this period, the system regime state (from a traditional...
agricultural regime \( (S_2) \) dominated by grain planting to an industrial and agricultural concurrent agricultural regime \( (S_3) \) dominated by working outside of farming) was the case for Zhujiawan Village to adjust its regime in the face of the serious disturbance brought about by Grain for Green policies.

At the beginning of 2006, under the background of new rural construction in China, tourism exploration and development momentum in rural areas improved [63]. With the excellent natural conditions and ecological environment of Zhujiawan Village, individual elite farmers took the lead in operating agritainment. In 2012, relying on the Niu Bei Liang national Forest Park, Zhujiawan Village received approximately USD 1.45 million in investments from a combination of national finance and China’s Beautiful Rural Construction Project [48]. Meanwhile, based on some funds received from the county government for poverty alleviation, it built tourism infrastructure and agritainment and introduced tourism home stay projects to vigorously develop rural tourism. The development of rural tourism in Zhujiawan Village began to take shape in 2013. Zhujiawan Village has become more active in adapting and transforming its traditional agricultural regime \( (S_3) \), which is dominated by working outside of farming, to a rural tourism regime \( (R_2) \). This adaptive process of active regime transformation aims to improve the poor livelihoods of the current situation and unstable livelihoods of migrating to work, making use of local ecological resources and national policy support.

(2) Yuanjia Village

The transformation of Yuanjia Village from a traditional agricultural regime \( (R_1) \) to a rural tourism regime \( (R_2) \) includes a diversified regime shift process (see Figure 3).
Among them, the agricultural regime has experienced three state changes: mainly grain planting ($S_1$), characteristic forest and fruit + small- and medium-sized enterprises ($S_2$), and working + farming ($S_3$).

During the period of collective economy (1950–1977), most farmers in Yuanjia Village community relied on traditional crops (wheat and corn) to sustain their livelihoods. However, drought and the poor quality of cultivated land often led to poor overall crop harvests and low standards of living. In 1970, the new village leader led the whole village to improve the situation of cultivated land, vigorously developing food production and solving the problem of food shortage. The rural system showed active adaptation and adjustment in a traditional agricultural regime dominated by food cultivation ($S_1$).

After the household contract responsibility system was established in 1978, Yuanjia Village contracted land to farmers and began to adjust the planting structure, vigorously promoting the fruit cultivation and breeding industries (see Figure 4). Meanwhile, under the market system adjustment of reform, the village collective invested in brick kilns and cement plants. Since the 1990s, the village collective has further increased its investment scale to establish a village collective enterprise group based on printing plants and automobile transportation and construction teams. In 2000, the village’s per capita annual income reached USD 1246, in stark contrast to the average rural per capita annual income, which was only about USD 330 at that time in China [48]. Yuanjia Village seized the opportunity of national policy reform and external market demand to develop its forest and fruit industry and collective township enterprises. Therefore, the transformation of system from $S_1$ to $S_2$ was active adaptation and adjustment. However, from 2000, due to the environmental pollution controls on small- and medium-sized enterprises in China (see Figure 4), the key small- and medium-sized enterprises in Yuanjia Village were shut down. In addition, with the rapid development of urbanization and farmers being forced to work in cities or farm locally, Yuanjia Village’s rural development stagnated. Disturbed by the implementation of the policy of “national regulation of small- and medium-sized enterprises”, the regime shift of rural system from $S_2$ to $S_3$ was a risk that the system was unable to cope with, and the system state appeared to be passive transformation adaptation.

After rural development was limited, Yuanjia Village collectively planned a new transformation, using CNY 200,000 (about USD 29,478) to buy the “golden idea” of “building an impression experience place of central Shaanxi plain” in 2007 [48]. In total, the village collective invested more than USD 3 million to develop rural tourism (see Figure 4). Taking advantage of its superior location and local road infrastructure, the needs of the rural leisure tourism market, and the accumulation of folk culture in the central Shaanxi plain, it promoted the rapid development and maturity of rural leisure experience tourism in Yuanjia Village. By October 2018, approximately 550 external merchants had settled in the area, driving the development of surrounding villages [48]. The system regime was transformed from $S_3$ to $R_2$. Government support for rural tourism exploitation also further promoted the active transformation of Yuanjia Village into a tourism regime.

(3) Zhaodai Village

Compared with Yuanjia and Zhujiawan, Zhaodai Village has not yet shifted to a new regime. To date, it has mainly experienced three different system state changes to its agricultural regime: traditional crop cultivation in the collective economy period ($S_1$), characteristic forest and fruit cultivation ($S_2$), and working + characteristic forest and fruit cultivation after the implementation of the household contract responsibility system ($S_3$), all of which represent incremental adjustments within the regime (see Figure 3).

During the period of collective economy (1950–1977) (the $S_1$ regime), residents of Zhaodai Village mainly planted traditional crops (wheat and corn). Around 1980, the local government began to explore kiwifruit planting technology, hoping to improve incomes through the introduction of cash crops. After acquiring technical expertise, farmers introduced Japanese kiwifruit varieties. The village collective borrowed about USD 1450 to buy kiwifruit seedlings and distributed them to farmers to encourage the development of kiwifruit agriculture. As a result, the system gradually entered the $S_2$ period. By 1993,
Zhaodai Village had begun to plant kiwifruit on a large scale, covering an area of approximately 400,000 square meters (see Figure 4). China’s household contract responsibility system further stimulated farmers’ production enthusiasm. On the basis of market liberalization and the Japanese demonstration of planting technology, Zhaodai Village took the development of characteristic forest and fruit as its main livelihood. The rural system from $S_1$ to $S_2$ involved active adaptation and adjustment under the rationality of community development. By 2011, the Louguantai Taoist Culture Exhibition Area, jointly developed by the Shaanxi Qujiang Culture and Tourism group and the Zhouzhi County government, was constructed in the village. The subsequent exploitation of scenic spots occupied a significant amount of land that had been cultivated for kiwifruit (see Figure 4). Approximately 186 farmers lost fruit trees, and tourism development enterprises were only provided a one-time compensation payment for their losses [48]. The landless farmers were forced to leave the village and find work elsewhere. Thus, from $S_2$ to $S_3$, the rural system of Zhaodai Village was disturbed by external tourism exploitation and entered the regime state of passive adjustment.

4.2. Adaptive Capacity of Tourism Transformation

Tourism development is a key step in rural transformation into a tourism regime. The analysis of the adaptive capacity of the system under regime shifts and its changes in each case can help us understand the impacts of tourism transformation on rural adaptive capacity. Through the comprehensive index method, the adaptive capacity of three rural cases under the tourism transformation was calculated. The results showed that there are significant differences in the adaptive capacity of rural systems under different regime shifts.

In terms of overall adaptive capacity, Yuanjia Village has the largest adaptive capacity index (0.668), while Zhaodai Village has the smallest adaptive capacity index (0.377), which is mainly reflected in the differences in the economy, management, and human dimensions (see Figure 5). Yuanjia Village had accumulated significant funds from the operation of village and town enterprises before initiating tourism development. In addition, the active tourism transformation has further explored the village’s rural cultural resources, and tourism operations have increased the community’s economic income. The improvement in economic capacity is also helpful to improve the education level of farmers in the community. The survey revealed that approximately 54% of the population in Yuanjia Village has a high school education or above. The tourism development mode of Yuanjia Village is a collective economy mode dominated by the community with residents’ full participation. Farmers have a positive attitude toward the flexibility of community management and residents’ discourse power.

At the same time, we calculated the adaptive capacity of the social and ecological subsystems. As shown in Table 4, the adaptive capacity of Yuanjia Village has increased the most (16.65%), while Zhaodai Village has decreased by 16.35%.

Table 4. The change in rural adaptive capacity in tourism transformation.

<table>
<thead>
<tr>
<th></th>
<th>Social Subsystem</th>
<th>Ecological Subsystem</th>
<th>SES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zhujiawan</td>
<td>+5.723%</td>
<td>−15.62%</td>
<td>+4.323%</td>
</tr>
<tr>
<td>Yuanjia</td>
<td>+16.45%</td>
<td>+20.01%</td>
<td>+16.65%</td>
</tr>
<tr>
<td>Zhaodai</td>
<td>−13.72%</td>
<td>−40.56%</td>
<td>−16.35%</td>
</tr>
</tbody>
</table>
At the subsystem level, the adaptive capacity of the ecological subsystem in Zhujiawan Village has decreased significantly (−15.62%) (see Table 4). Tourism activities not only promote economic development but also bring considerable problems related to environmental pollution. During the investigation period, Zhujiawan Village was starting to build a sewage treatment infrastructure. For a long time, the domestic sewage generated by tourists and agritainment businesses, and rural kitchen waste was directly discharged into the river. In one interview, a farmer said, “In the past, the water from the river could be used to raise fish, but now it cannot”. In addition, the farmers stated that there are too many cars during the peak tourist season, which creates a certain degree of air pollution from car exhaust, and tourists randomly throw garbage into the river. The adaptive capacity of the social (+16.45%) and ecological (+20.01%) subsystems in Yuanjia Village has increased significantly (see Table 4). According to the survey, Yuanjia Village’s tourism development adopts a management mode of benefit sharing, which promotes social and economic adaptive capacity, such as economy, society, environment, and housing, under the good development momentum of the industry. Simultaneously, compared with the extensive production of small township enterprises in the past, the development process of rural tourism transformation is conducive to environmental protections, and the adaptive capacity of the ecological subsystem increases. The adaptive capacity of the social and ecological subsystems decreased in Zhaodai Village, especially in the ecological subsystem (−40.56%) (see Table 4). Since 2011, due to the forced relinquishment of land for tourism development, farmers’ interests have been marginalized, and the contradictions between the farmers, the government, and development enterprises are significant. Farmers affected by tourism land acquisition have lost their cultivated land and the sources of their livelihoods. The process of passive transformation adaptation results in the mood of farmers’ resistance, and farmers negatively view the social and ecological effects of tourism development.

On the dimension level (as shown in Figure 6), the adaptive capacity of the economy, housing, and human dimensions in the case area has improved after the shift from a traditional agricultural regime to a tourism regime. Among them, Yuanjia Village has a significant advantage in economic capital growth (170.3%), while Zhujiawan Village has a significant advantage in housing capital growth (259.5%). The development of rural tourism has generally increased the income of the rural economy in all three cases. Due to the needs of tourism development (the sites needed for agritainment operations and accommodation) and the increase in income, housing conditions have improved. In addition, due to other factors, e.g., poverty alleviation measures and land acquisition compensation, the improvement in housing capital in Zhujiawan Village is the most apparent. However,
the differences in tourism development subject and management mode, as well as interest competition, lead to the social problems of a weak discourse power of farmers in the community and the deterioration of the neighborhood atmosphere. Zhujiawan and Zhaodai villages show different degrees of reduction in the social, environmental, and management dimensions. In one interview, a resident of Zhaodai Village mentioned that “in the past, everyone in the neighborhood helped each other. Now it is the age of money, and we all take money to hire people”.

Figure 6. The change ratio of adaptive capacity dimension of tourism transformation in different villages. Notes: E–economic, L–labor, SE–social environment, H–housing, M–management, EE–ecological environment.

4.3. Adaptedness (Adaptive Outcomes) of Tourism Transformation

As far as system purpose is concerned, Yuanjia Village is the best, followed by Zhujiawan Village, and, finally, Zhaodai Village (see Table 5). Because the human settlement environment of the system purpose is centered on the rural farmers’ perceptions, Yuanjia Village, with high economic income and good social and ecological environment, is perceived by farmers as being more successful. In contrast, farmers in Zhaodai Village generally believe that tourism development destroys the original livelihood scheme and stability, and future rural development is full of uncertainty. Meanwhile, in Zhaodai Village, the community collective recognition is reduced, the rural community atmosphere has worsened, and the perception of material life and emotional identity is poor.
Table 5. Adaptedness of tourism transformation in different villages.

<table>
<thead>
<tr>
<th>Village</th>
<th>Human Settlements Environment (Numerical Values)</th>
<th>Income Diversity (Numerical Values)</th>
<th>Gap between Rich and Poor (Numerical Values)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yuanjia</td>
<td>4.57</td>
<td>0.30</td>
<td>2.17</td>
</tr>
<tr>
<td>Zhaodai</td>
<td>2.60</td>
<td>0.20</td>
<td>3.20</td>
</tr>
<tr>
<td>Zhujiawan</td>
<td>3.58</td>
<td>0.17</td>
<td>3.60</td>
</tr>
</tbody>
</table>

In terms of system stability, Yuanjia Village is the highest, and Zhaodai Village is only slightly higher than Zhujiawan Village. The average household income diversity index of Yuanjia Village is 0.30, which mainly comes from tourism operations, collective dividends, working outside farming, or wages. Among them, tourism operation and collective dividend income all exist in the household income structure. The income diversity index of Zhaodai Village is 0.20, and primarily comes from fruit cultivation and working outside of farming, while a small amount is generated by participation in tourism. Most of the farmers whose land was expropriated work outside of farming, and the income diversity among families demonstrates obvious polarization. The average household income diversity index of Zhujiawan Village is 0.17, which is mainly the income of tourism operations and working outside of farming. Few households earn regular wages. Non-tourism operators often rely only on the income of working outside of farming, and a few families receive poverty alleviation subsidies or earn a small amount of agricultural income.

System coherence reflects the internal fairness and wellbeing of the system. The gap between the rich and poor in Zhujiawan Village is the largest, followed by Zhaodai Village and Yuanjia Village. The small gap between the rich and poor in Yuanjia Village is closely related to the tourism development mode of its collective economy, and the community economic income and interests are shared. Zhujiawan Village is located in the poverty-stricken region of the Qinling-Daba Mountains in China. In Zhujiawan Village, rural tourism can significantly increase farmers’ economic income, but the rate of residents’ participation in tourism is only about 35%. Although tourism poverty alleviation projects help some farmers escape poverty, approximately 13.6% of households in Zhujiawan Village still are impoverished. Due to the process of rural regime shifts, differences in adaptive strategies of farmers’ livelihood lead to livelihood output differentiation. The gap between the rich and poor in rural communities is widening because of farmers engaging in tourism operations and working outside of farming, which lifts them out of poverty. However, the income of farmers in Zhaodai Village mainly arises from working outside of farming, the work content is homogeneous, and the income difference among households is small. Meanwhile, due to the low participation in tourism, tourism development has little effect on farmers’ income, and the gap between the rich and poor is not significant.

4.4. Influencing Factors of Adaptedness (Adaptive Outcomes)

To explore how the adaptive capacity of rural tourism transformation affects system adaptedness (adaptive outcomes) under different regime shift processes, we use the step-wise multiple regression analysis method to analyze the adaptive capacity index factors and the system adaptedness (adaptive outcomes) characterization factors using a linear regression model.

As shown in Table 6, the main factors affecting the adaptation results of Zhujiawan Village are ecological environment factors, per capita income, employment rate, and residents’ discourse power. Among them, water and air quality are direct reflections of the ecological environment, and the impact on human settlements is dominant. After the development of rural tourism in Zhujiawan Village, the adaptive capacity of the ecological environment has declined (see Table 4). In particular, residents’ discourse power has been negatively impacted. In the process of tourism transformation and management, the farmers in Zhujiawan Village think that they have not received or have not equally enjoyed the economic benefits brought about by tourism activities, and their livelihood interests have
been lost. The lack of discourse power will lead to the problem of interest distribution in the process of rural tourism transformation, which is also one of the important reasons for Zhujiawan Village having the biggest gap between rich and poor. The analysis of adaptive capacity also shows that the adaptive capacity of management dimension in Zhujiawan Village has decreased significantly after the tourism transformation, and in the adaptive outcome the gap between the rich and poor is, relatively speaking, the largest. The head of an agritainment explained, “It is useless for farmers to say anything. The land and houses are occupied. If there is no land, there is no income. Agritainment must be opened. Farmers cannot earn much money”.

Table 6. Stepwise regression results of influencing factors of adaptedness.

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Zhujiawan a</th>
<th></th>
<th></th>
<th>Yuanjia b</th>
<th></th>
<th></th>
<th>Zhaodai c</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Human settlement environment</td>
<td>Influencing Factors</td>
<td>Coef</td>
<td>T</td>
<td>Sig.</td>
<td>Influencing Factors</td>
<td>Coef</td>
<td>T</td>
<td>Sig.</td>
<td>Influencing Factors</td>
</tr>
<tr>
<td>Air quality</td>
<td>0.335 *</td>
<td>3.884</td>
<td>0.000</td>
<td>Traffic accessibility</td>
<td>0.394 **</td>
<td>2.959</td>
<td>0.014</td>
<td>Per capita income</td>
<td>0.267 **</td>
</tr>
<tr>
<td>Water quality</td>
<td>0.231 *</td>
<td>2.618</td>
<td>0.010</td>
<td>Quality of the labor force</td>
<td>−0.353 **</td>
<td>−2.326</td>
<td>0.027</td>
<td>Housing type</td>
<td>0.416 *</td>
</tr>
<tr>
<td>Per capita income</td>
<td>0.197 **</td>
<td>2.237</td>
<td>0.027</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income diversity</td>
<td>Influencing Factors</td>
<td>Coef</td>
<td>T</td>
<td>Sig.</td>
<td>Influencing Factors</td>
<td>Coef</td>
<td>T</td>
<td>Sig.</td>
<td>Influencing Factors</td>
</tr>
<tr>
<td>Employment rate</td>
<td>0.249 *</td>
<td>2.639</td>
<td>0.010</td>
<td>Neighborhood atmosphere</td>
<td>0.380 **</td>
<td>2.485</td>
<td>0.018</td>
<td>Quality of the labor force</td>
<td>0.256 **</td>
</tr>
<tr>
<td>Social connectedness</td>
<td>0.190 **</td>
<td>2.156</td>
<td>0.033</td>
<td>Level of participation in tourism</td>
<td>0.329 **</td>
<td>2.150</td>
<td>0.039</td>
<td>Neighborhood atmosphere</td>
<td>0.262 **</td>
</tr>
<tr>
<td>Gap between rich and poor</td>
<td>Residents’ discursive power</td>
<td>−0.382 *</td>
<td>−4.239</td>
<td>0.000</td>
<td>Dependency ratio</td>
<td>0.514 *</td>
<td>2.330</td>
<td>0.001</td>
<td>Housing area</td>
</tr>
</tbody>
</table>

a. Model 1: Dependent variable is human settlement environment, adjusted $R^2 = 0.67$ ($p < 0.001$); Model 2: Dependent variable is the index of income diversity, adjusted $R^2 = 0.54$ ($p < 0.001$); Model 3: Dependent variable is the index of the gap between the rich and poor, adjusted $R^2 = 0.58$ ($p < 0.001$); * $p < 0.01$; ** $p < 0.05$. b. Model 1: Dependent variable is human settlement environment, adjusted $R^2 = 0.47$ ($p < 0.005$); Model 2: Dependent variable is the index of income diversity, adjusted $R^2 = 0.58$ ($p < 0.001$); Model 3: Dependent variable is the index of the gap between the rich and poor, adjusted $R^2 = 0.61$ ($p < 0.01$); * $p < 0.01$; ** $p < 0.05$. c. Model 1: Dependent variable is human settlement environment, adjusted $R^2 = 0.47$ ($p < 0.005$); Model 2: Dependent variable is the index of income diversity, adjusted $R^2 = 0.50$ ($p < 0.001$); Model 3: Dependent variable is the index of the gap between the rich and poor, adjusted $R^2 = 0.63$ ($p < 0.001$); * $p < 0.01$; ** $p < 0.05$.

In addition, the factors affecting income diversity (system stability) of farmers in Zhujiawan Village are the employment rate and degree of social connection. The income source of farmers in Zhujiawan Village is single, mainly from tourism income and working outside of farming, and the employment rate in the tourism industry has not been high after shifting from a traditional agricultural regime ($R_1$) to a rural tourism regime ($R_2$). On the contrary, the proportion of farmers whose income depends on working outside of farming is relatively large. The degree of social connection in this study refers to the borrowing and lending situation under economic difficulties. Financial support for farmers in Zhujiawan Village to start agritainment businesses mainly comes from borrowing from relatives and friends. Because they are located in poor mountainous areas and their social network resources are relatively scarce, the regime stability is relatively poor in the adaptation effect of the rural system.

The adaptive evolution process of Yuanjia Village is mainly affected by traffic accessibility, the neighborhood atmosphere, tourism participation, and the dependency ratio. Due to the fact that Yuanjia Village is situated within the Xi’an economic circle, the good traffic conditions support tourism management and enhance residents’ daily lives. The neighborhood atmosphere affects farmers’ employment opportunities and agritainment enterprise management status via the sharing of employment information, mutual assistance, and sharing customers. In the adaptive process of Yuanjia Village evolving from a traditional agricultural regime ($R_1$) to a rural tourism regime ($R_2$), due to the collective operation of tourism management mode, the overall tourism participation is high, the difference between households is small, and the impact on income diversity is relatively
weak. In particular, there is little competition among neighbors, and the interests are shared. Therefore, a good neighborhood atmosphere and tourism development model promote the prosperous development of a rural socioeconomic system. The results of adaptation are most notable in terms of human settlement environment, income diversity, and the gap between the rich and poor.

Relatively speaking, the adaptive evolution of Zhaodai Village has not entered the phase of a new system regime, and its adaptation effect is not significant. However, affected by the factors of per capita income and housing type, farmers’ perceptions of the effect of the adaptation of human settlements are poor. Per capita income and housing type are significant factors of both the economic and housing dimensions. After the implementation of tourism development, the risk of ecological damage increases due to enterprises forcing farmers to give up their farmland. In addition, the low tourism participation rates lead to the marginalization of farmers in the interests of tourism development, and the adaptive capacity of social and ecological subsystems decreases significantly (see Table 4), with only the economic and housing dimensions showing improvements. However, compared with Yuanjia and Zhujiaowan villages, the enhanced economic income and housing conditions brought about by their passive tourism transformation (not a direct shift to a tourism system) are not obvious. At the same time, the stability of the regime (income diversity) is affected by the quality of the labor force and the neighborhood atmosphere (see Table 6). The tourism development mode of rural farmers’ marginalization dominated by Zhaodai Village enterprises ignores the need for re-employment and skill training of farmers. For most farmers, the only way to sustain their livelihoods is to work outside of farming by themselves. In the survey, farmers stated that "they go out to look for their own jobs by themselves, and no one introduces them to the job". Therefore, the value of human settlements and income diversity is low in terms of the actual results of rural adaptation.

4.5. Implications for Rural Adaptation Pathways

Our results show that the rural tourism transformation is a double-edged sword. First, it can bring rapid improvement in the rural economy and material capital factors, and it also easily brings ecological pressure and even environmental damage. Second, with regard to original livelihood methods, it can increase the diversity of farmers’ livelihoods. However, discarding traditional livelihoods and the market fluctuations of tourism operation may increase farmers’ uncertainty and livelihood risk, and even cause the social risk of the widening the gap between the rich and the poor, which is affected by the tourism development mode. Therefore, in the process of rural transformation adaptation, the tourism transformation should be community-oriented, avoid ecosystem damage caused by predatory tourism development, pay attention to farmers’ livelihood guidance, and reduce the risk of livelihood uncertainty [14].

In China’s top-down management, the changes in the national system and policy have a significant impact on the direction and process of micro-rural development [64]. Based on the principle of economic rationality, rural collectives adapt to changes spontaneously or are induced by the external environment to enter the tourism regime, which is active tourism transformation. However, rural incremental adjustment (not entering the tourism regime) dominated by government policies or enterprise behavior is a passive form of tourism transformation. The different results of the three cases indicate that the adaptation process of different regime shifts in rural areas leads to rural risk interference and adaptive capacity differences and directly affects the results of system adaptation. Relatively speaking, the regime shift of rural community active adaptation is more conducive to the accumulation of adaptive capacity, and a strong community foundation and the tourism development mode of benefit sharing can promote the benign adaptation of rural systems, which is consistent with the case study of northern Arizona explored by Pennesi (2007) [65]. This case is also a process of the deliberate transformation (active tourism transformation) from an agricultural economic base to a system relying on tourism and regional service provision, which is high resilience and adaptation. However, the difference is that this case of tourism
transformation is also affected by government policies (the city council), while the results of this study show that the passive tourism transformation is supported or guided by government policies. However, when government “hematopoietic” support fades or there is a regulatory failure, rural overall maladaptation can easily result. This is especially true with respect to social conflicts of interest and the weakening of discourse power, as seen in Zhaodai and Zhujiawan villages. Therefore, the process of active or passive transformation adaptation and government behavior in this process play a decisive role in determining the effect of the rural transformation adaptation.

In addition, the influencing factors of the results of the system adaptation of the three cases are mainly concentrated in the social and economic dimensions, and the social relationship network represented by neighborhood atmosphere and social connection degree become the common influencing factors of the three cases. This indicates the importance of the construction and reconstruction of the social relationship network to the positive adaptation of rural systems. Farmers’ interests, the discourse power, and the improvement in rural economy and material conditions are the core elements to achieve positive rural transformation and adaptation in different regime shifts. Therefore, the mode of transformation adaptation of rural tourism should take the rural community as the guide to carry out active adaptation. The policy formulation and implementation should pay attention to the interests and discourse power of farmers, and mobilize the enthusiasm of farmers to participate on the basis of protecting the interests of farmers’ livelihood. Secondly, the transformation adaptation of rural areas should conform to the direction of national strategies and policies, and the government needs to provide financial and technical assistance for the rural regime shift. Finally, the ecological environment is the basis for maintaining the development of human life. Rural tourism development should adhere to the protection of the ecological environment, which is crucial to the sustainable development of rural social–ecological systems.

4.6. Research Limitations and Challenges

In this study, because the most micro statistical scale of government statistics at all levels in China only reaches the township or county, and is limited by the lack of statistical data at the community or village level, this paper uses rural household survey data and interview data to study the process and results of tourism transformation adaptation under the rural regime shift. On the one hand, this research method expands the data sources at the community or village scale, makes up for the lack of statistical data, and uses micro survey data to study the long-term adaptation process of rural communities, which is innovative. On the other hand, it must be admitted that the survey data still have a certain degree of subjectivity and cannot fully reflect the changes in the ecosystem of the case villages, so the combination of macro analysis of experiments or statistical data and micro analysis of survey data can more comprehensively reflect the social–ecological systems impact in the process of rural system transformation, so as to provide more targeted suggestions for the sustainable development decision making of rural tourism and the improvement in farmers’ livelihood and wellbeing.

In addition, this paper proposes an adaptation analysis framework of social–ecological systems transformation, which is suitable for qualitative and quantitative research on the transformation adaptation process of rural social–ecological systems. In this paper, we verify the effectiveness of the adaptation process, capacity, and outcome analysis of rural tourism transformation in different cases, but there may still be uncertainties in the assessment of other types of social–ecological systems’ transformation and adaptedness. This is because the threshold value of system conversion is not quantified, and the threshold of system conversion is different for different types of systems, so more case studies are needed to verify and improve this.
5. Conclusions

Based on the combination of actor orientation and system path adaptation analyses, this study constructed an adaptation analysis framework of SES transformation. We applied it to the research of rural tourism transformation in different cases in Western China since the reform and opening-up (1980s) to explain the effects and influencing factors of rural transformation adaptation under the regime shift. The research framework reveals the logical relationships in the adaptive process, the adaptive capacity, and the adaptive outcomes, emphasizing understanding system adaptation as a process variable, which provides a practical analysis tool for the assessment of rural transformation adaptation in different regions of the world.

This case study indicates that while regime change has promoted the adaptation shift of the case village from a traditional agricultural regime to a tourism regime, the adaptation effect differs significantly due to the differences in regime shifts in the adaptation process. First, in the adaptation process of rural transformation, the shift of regime state is diversified, and the regime shift of active adaptation has better adaptive capacity and adaptation effect. Taking Yuanjia Village as an example, active adaptation helps to accumulate positive adaptive capacity and effectively deal with risk interference in the next stage of the system. Notably, this village had strong advantages in adaptive capacity and adaptation results under the tourism transformation. Second, there are significant differences in adaptive capacity and adaptation results of regime shift and incremental adjustment of the system. Faced with the difficulties of rural transformation and development and the risks associated with tourism development, Zhaodai Village could not effectively adapt to the new regime. Importantly, passive incremental adjustment reduces the adaptive capacity of rural community. In addition, compared with the adaptation results of Yuanjia Village’s tourism transformation, Zhujiawan Village, which is supported by national policy, still experienced maladaptation in its active adaptation process, indicating that the tourism development mode of a strong community foundation (accumulation of adaptive capacity) and benefit sharing positively affect the shift from a traditional agricultural regime to a tourism regime.

Meanwhile, there are differences in the factors that affect the results of system adaptation under different regime shift processes. In addition to the variation in community foundations caused by historical processes, an important factor of different adaptation results is the development (management) mode of rural tourism. In the process of the transformation from traditional agricultural villages to tourism villages, the tourism development (management) mode should be community-oriented and fully protect the basic livelihood interests of residents. For the transformation adaptation of any rural community in the world, the key to promoting the rural sustainable development is to protect the interests and discourse power of farmers.

Author Contributions: Conceptualization, J.C.; Methodology, J.C., W.C. and F.W.; Formal analysis, W.C.; Investigation, J.C. and M.D.; Resources, F.W.; Data curation, W.C.; Writing—original draft, J.C. and M.D.; Writing—review & editing, J.C.; Visualization, W.C.; Project administration, J.C.; Funding acquisition, J.C. All authors have read and agreed to the published version of the manuscript.

Funding: This work was supported by the Humanities and Social Sciences Youth Foundation, Ministry of Education of China (grant number 19YJCZH006).

Data Availability Statement: The data presented in this study are available on request from the corresponding author due to the data involves the privacy information of the respondents.

Acknowledgments: The authors extend great gratitude to the reviewers and editors for their helpful reviews and critical comments. We appreciate Sha Yin’s contribution to the formal analysis and manuscript review in this study.

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


2. Burholt, V.; Dobbs, C. Research on rural ageing: Where have we got to and where are we going in Europe? J. Rural. Stud. 2012, 28, 432–446. [CrossRef]


20. Seweryn, Z.; Yoonjeong JSeong-il, K.; Celene, B.M. Why community-based tourism and rural tourism in developing and developed nations are treated differently? A review. Sustainability 2020, 12, 5938. [CrossRef]

21. Liu, R. The state-led tourism development in Beijing’s ecologically fragile periphery: Peasants’ response and challenges. Habitat Int. 2020, 96, 102119. [CrossRef]


23. Long, H.L.; Ma, L.; Zhang, Y.N.; Qu, I.L. Multifunctional rural development in china: Pattern, process and mechanism. Habitat Int. 2022, 121, 102530. [CrossRef]


30. Lopes, H.S.; Remolado, P.C.; Ribeiro, V.; Martin-Vide, J. Pathways for adapting tourism to climate change in an urban destination—Evidences based on thermal conditions for the Porto Metropolitan Area (Portugal). J. Environ. Manag. 2022, 315, 115161. [CrossRef]


35. Eakin, H.; Lemos, M.C. Adaptation and the state: Latin America and the challenge of capacity-building under globalization. *Glob. Environ. Chang.* **2006**, *16*, 7–18. [CrossRef]


**Disclaimer/Publisher’s Note:** The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.