Spatial Distribution Suitability of Ethnic Minority Villages

Subjects: Ethnic Studies

Contributor: Xiang Xu , Paolo Vincenzo Genovese

Ethnic minority villages are important resources for the economy and social development of ethnic minority areas because they preserve ethnic minorities' culture. With the rapid development of industrialization and urbanization in China, the factors affecting the development of villages have changed. With the help and guidance of the government, the gap between villages has increased. According to the development conditions of ethnic minority villages, the suitability of their spatial distribution has been studied, the existing problems in the current development have been explored, and the development laws and future development trends have been found.

suitability analysis ethnic minority villages China

1. Introduction

Ethnic minority villages refer to villages with a relatively high proportion of ethnic minority population, complete production and living functions, and obvious ethnic culture and settlement characteristics. In terms of architectural form, and customs, ethnic minority villages are relatively complete and retain the culture of ethnic minorities, reflecting the diversity of Chinese culture [1]. The guiding opinions of the State Ethnic Affairs Commission on further strengthening and regulating the protection and development of ethnic minority characteristic villages and towns in the new period pointed out that "the construction of ethnic minority characteristic villages and towns should be included in the implementation plan of the Rural Revitalization Strategy, and orderly promote the protection and development of ethnic minority characteristic villages and towns [2]. So far, there are 1652 ethnic minority villages in China. The protection, utilization, and development of ethnic minority villages have become a topic of great concern to the government.

Historically, ethnic minorities in some areas chose to live in areas with closed terrain because of avoiding wars or ethnic disputes. The spatial distribution of villages is closely related to the terrain [3]. However, with the rapid development of industrialization and urbanization in China, the conditions on which the development of ethnic minorities was based have changed greatly. The traditional agriculture is no longer the decisive factor for the development of villages, and the terrain is no longer the dominant factor for the development of villages. Natural, economic, cultural, and other factors jointly affect the development of villages. Since the implementation of the pilot project of protection and development of ethnic minority villages in 2007, great achievements have been made in the protection and development of ethnic minority villages in China. In 2009, the State Ethnic Affairs Commission and the Ministry of finance began to implement the protection and development project of ethnic minority villages. The central government invested 270 million yuan in developing ethnic minorities, focusing on protecting and

transforming houses, strengthening infrastructure construction, and improving the living environment [4]. According to the situation of villages, the local government should formulate reasonable special plans [5]. As the province with the largest population of Shē nationality in China, Fujian Province tries to solve the practical problems of ethnic minority villages by formulating the protection and development plan of ethnic minority villages, selecting characteristic villages, and establishing an experimental area for ethnic cultural and ecological protection, and achieved phased results. The protection and development of villages is a long-term problem. After years of development, the development gap between villages and ethnic minority villages distributed in different spatial and geographical locations has widened under different development conditions when the government intervention is small or separated from the direct assistance of the government. Because of the superior geographical location, convenient traffic conditions, and rich cultural relics, some villages have rich industrial development, the villagers' lives have been gradually improved, and the villages can continue to develop healthily. There are also some villages that cannot enjoy the convenience brought by social development. The economic income is low, and the population of the villages flows out. After a large amount of human, financial and material resources are invested, the effect is very small, and the development forms a vicious circle. After being separated from the government's intervention and assistance, the inconvenient transportation has led to less contact between ethnic minority villages and cities, some villages even have language barriers with cities, and the needs of villagers in villages cannot be met. Villagers give up their old houses and choose to settle in counties and other places [6][7][8], which to a certain extent aggravates the decline of villages, and the villages have problems such as disappearance of characteristics [9], air waste [10], and unbalanced resource distribution [11].

The main reason is that the villages suitable for agricultural society cannot meet the contemporary development, and the fundamental problems cannot be solved by merely relying on the continuation of village culture and focusing on Agricultural Development [12][13]. At this stage, it is necessary to conduct a new suitability evaluation on the village according to the contemporary situation of the village to reflect the development status of the village at this stage. The suitability evaluation of spatial distribution is to evaluate the geographical spatial distribution of the village according to the main factors affecting the development of the village at the present stage. At the same time, the selection of indicators has shifted from the terrain indicators to the common influence of natural geographical, socio-economy and cultural life, and the typical representative indicators that affect the development of the village are selected from the numerous evaluation indicators. To classify a large number of ethnic minority villages in Fujian at the present stage according to suitability, scientifically and reasonably show the development status of the ethnic minority villages, excavate the existing problems in the current development, and finally find out their development laws and future development trends. Under the background of urbanization, based on the scientific and objective evaluation results of the suitability of ethnic minority villages, it has become an important direction for the study of ethnic minority villages to formulate reasonable development strategies for ethnic minorities, help governments at all levels to reasonably allocate resources and achieve a targeted goal.

2. Suitability Evaluation Object

It mainly includes the research on the spatial distribution characteristics and suitability of rural settlements in Shanxi Province [14], the research on the spatial distribution suitability of affordable housing in Xi'an [15], the research on the spatial distribution suitability of elderly care facilities in Xingning District, Nanning [16], a study on the suitability of spatial distribution Pinus massoniana in Hubei province [17], study on the suitability of spatial distribution of alcohol outlets in the community [18], study on the suitability of spatial distribution of Eurasian butterflies [19], study on the suitability of the spatial distribution of Pitaya planting in plateau mountainous area [20], study on the suitability of spatial distribution of ecotourism potential areas [21], study on evaluation of construction land [22][23], and a study on the suitability of spatial distribution of sanitary landfill [24]. Therefore, from the perspective of research objects, the research on the suitability evaluation of spatial distribution is mostly concentrated in rural settlements, urban housing, public service facilities, plants, animals, crops, and other fields. For ethnic minority villages in rural settlements, most of the research is on the spatial distribution characteristics, evolution and driving factors.

3. Suitability Evaluation Indicator

Indicators covering topographic features, location environment, as well as the indicators of the economy, policies and regulations, climate, geological disasters, and other aspects were selected according to the goal orientation. The main research includes selecting the altitude, slope and river in the topographic features and the distance from the County Center in the location environment to construct the evaluation indicator of rural residential areas in Shanxi Province [14], selecting altitude, slope, soil, land use, land cover, agriculture, precipitation, river and road network, as well as settlement spread to evaluate urban green belts [25], selecting the altitude, slope, river, topographic relief in the topographic features, the distance from the town center, and the distance from the road in the location environment to construct the evaluation indicator of rural residential areas in Karst Mountainous areas [26]. The suitability distribution of poverty alleviation and relocation of Yi villages in Liupanshui based on goal orientation focuses on policies and regulations [27] in the selection of the evaluation indicator. The settlement phenomenon around the coal mine is based on the geotechnical data of the upper side of the evaluation indicator selection [28]. The suitability distribution of bird habitats in Dongting Lake Basin under the scenario of climate change focuses on climate in the selection of evaluation indicators [29]. The suitability distribution of rural residential areas in karst mountainous areas focuses on geological conditions in the selection of the evaluation indicator [30]. Based on the differences between different conditions and development objectives, the selection of the evaluation indicator is affected by both subjective and objective factors. Therefore, from the perspective of evaluation indicators, scholars choose evaluation indicators according to the regional characteristics and goal orientation of the research object. The subjectivity of indicator selection is strong, and different researchers may obtain different research results for the same region. Natural disaster factors such as landslides, debris flows and floods, which are closely related to the topographic characteristics of mountainous areas and dense river networks in Fujian, are often ignored.

4. Suitability Evaluation Method

The suitability of spatial distribution is based on the concept of land suitability, and its methods cover the fields of land use, ecological suitability, and so on. Both are based on the superposition analysis method established by McHarg (1967) by combining the suitability analysis method with theory. With the development and popularization of Geographic Information System (GIS) technology, equal weight analysis has hardly been used. The weighted evaluation model and classification algorithm based on the Analytic Hierarchy Process (AHP) have been established [31][32]—for example, niche model [33][34], maximum entropy model (MaxEnt) [35][36], K-means evaluation model [37][38], fuzzy comprehensive evaluation method [27], multi influencing factor (MIF) analysis method [39][40], and multi-factor superposition (MCE) analysis method [41]. These algorithms are usually used to analyze numerical data, while GeoDetector can analyze both numerical data and qualitative data [42]. Therefore, from the perspective of evaluation methods, AHP has become the most important method in the suitability evaluation of spatial distribution, but this method may lead to deviation in the evaluation results. The weight based on the AHP method only needs to consider the strong relationship between the evaluation indicator and the suitability of spatial distribution, and the relative importance of evaluation factors and does not need to undergo many calculations. This method relies on the experience of participants or experts, academic experience, and objective-oriented qualitative judgment to determine the relationship between them, to obtain the weight value. When there are too many evaluation factors or the relationship between them is not clear, there will be obvious differences in weights. The GeoDector can analyze the statistical data of each evaluation factor to quantify the influence of each factor, and its quantitative results are used to guide the analytic hierarchy process (AHP) method to generate the weight value of each factor.

Based on the above analysis, this establishes a suitability evaluation model based on GeoDetector and the AHP method to evaluate the suitability of the spatial distribution of ethnic minority villages in Fujian, which can solve the problem that there are no norms and standards for the selection of indicator factors and the assignment of factor weights, and effectively improve the scientific and objectivity of suitability evaluation. The research results can provide a reference for the precise development and protection of ethnic minority villages. Governments at all levels can adjust and optimize the development strategies of ethnic minority villages in appropriate areas in combination with the suitability evaluation results of ethnic minority villages and increase the resource allocation for the construction of ethnic minority villages in unsuitable areas. The research method can also be popularized and applied in other areas, which has important practical significance for guiding the development of minority villages.

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