



## Research Review on Accessibility and Equalization of Public Cultural Services in Chinese Rural Areas

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**Abstract:** Geographers have conducted a lot of research on the accessibility of public service facilities and the equalization of public services based on the perspective of human-land relationship. The common feature is to analyze the accessibility and equalization of a specific type of public service facilities, to understand the current spatial pattern of service facilities, to evaluate the spatial balance of facility distribution, to identify the scarcity areas of facility supply, and to optimize the overall deployment pattern by selecting sites for new facilities with other measurement methods. In terms of research area, there are more large-scale spatial accessibility studies in favor of urban areas, but few studies specifically focus on accessibility in rural areas; there is also a lack of research on the spatial pattern of equalization based on the rural perspective. From the perspective of public service facility types, medical and education are the main research objects, while cultural service facilities are less involved. Therefore, research on the spatial accessibility and equalization of public service facilities should be extended more to cultural facilities, especially the spatial equity of public cultural service facilities in rural areas. The focus should be on how to visually express the layout of public cultural services as well as comprehensively consider factors such as the location of rural settlements, distance to facility sites, transportation networks, travel modes, and choice preferences. It is suggested to introduce the analysis of multiple quantitative indicators of accessibility into the planning and construction of public service facilities to further strengthen the realism and scientificity of public service facility planning. Reasonable site selection and optimization of layout patterns for public cultural facilities is also a key factor to improve the construction of a basic public service system in rural areas.

**Keywords:** rural public culture, accessibility, equalization, spatial pattern

### I. Research on rural public cultural services

One of the most important duties of a government is to provide basic public service for the public and citizens. In China, since the reform and opening up in the 1970s, the public service of both rural and urban areas has been increasingly improved. In the past few decades, however, due to the policy of giving priority to the development of urban areas, there is an increasing gap in public services between urban and rural areas, especially in the allocation of basic public services[1]. As an important part of basic public services, urban basic public cultural services optimize rural areas in terms of quantity, scale and spatial layout, and the

government's institutional arrangements and financial support also show an obvious "urban bias". With the improvement of national cultural quality and living standards, the demand of farmers for public cultural services is also increasing and tends to be diversified. In order to meet the increasing cultural needs in rural areas, shorten the gap between urban and rural areas and achieve social equity, the government has gradually given more attention and support in terms of system, policy and finance, and scholars in different fields have studied the current level of development of public cultural services in rural areas from different aspects on the efficiency and equity of public cultural services.

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To promote the construction of a new socialist countryside in the outline of *The Eleventh Five Year Plan for National and Economic Development of the People's Republic of China*, Chinese government proposed that the implementation objectives for the construction of rural public cultural services should be increased[2]. It is necessary to increase investment in rural cultural development, strengthen the construction of county cultural centers, libraries, township cultural stations, village cultural rooms and other public cultural facilities, and build and improve the rural public cultural service system. In January 2006, A Few Suggestions on Deepening The Reform Of The Cultural System released by the General Office of the State Council, PRC, stated that the nation should rationally allocate cultural resources, promote the allocation of cultural resources to the countryside, increase investment in the construction of rural cultural infrastructure so that the nation can gradually solve the problem of insufficient rural cultural products and services[3]. In October 2008, The Sixth Plenary Session of the Seventeenth Central Committee of the Communist Party of China put forward three principles for the prosperity and development of rural culture: to increased investment in rural public cultural undertakings; to increase the percentage of rural cultural resources; to built a complete rural public cultural service system. The government work report at the national two sessions in March 2010 proposed to gradually promote the equalization of rural basic cultural public construction and accelerate the construction of rural cultural service facilities. In November 2015, *The Proposal Of The Central Committee Of The Communist Party Of China On Formulating The 13th Five Year Plan For National Economic And Social Development* stated clearly that it is essential to strengthen the public cultural service system in rural areas, to increase the total amount of rural cultural services, to encourage cities to provide cultural assistance to rural areas, and gradually narrow the gap between urban and rural cultural development[4]. The documents released by the government and meetings held by the state councils proved the importance of strengthening rural public cultural services. China is committed to building a sound rural public cultural service system to achieve the balanced and equal development of rural cultural services. Under the guidance of national policies, Chinese scholars began to study the current development of rural public culture. Many of them aimed to analyze the decline and reconstruction of rural public cultural services and explore the supply-demand relationship of public cultural services. Some scholars focused on the construction of specific public cultural service facilities such as rural bookstores or township libraries. Researches like Li Jia, Gu Jinfu, Li Shaohui hold that rural public cultural services should change the single subject and top-down supply mode dominated by the government. Overstatements at all levels should work on marketization and socialization system, and

build a multi subject interactive and cooperative supply mode on public cultural services[5]. Fu Chun, Zhang Jianhua, Li Yan, Wang Fen Lin, after discussing the construction of rural public cultural service system, put forward four modes-government supply, market supply, private supply and mixed supply[6].

## **II. Accessibility Measurement of Public Cultural Services**

The spatial accessibility measure has good visibility in the analysis of the spatial pattern of public service facilities, which is easy to reveal the spatial distribution of facilities visually and determine the balance of spatial distribution, so as to further identify the areas where facilities are oversupplied, poorly matched and undersupplied. Rural public cultural services are one of the important components of rural public services, and accessibility measurement is the basis for studying the rationality of the deployment of rural public cultural service facilities, as well as the main means to understand their spatial pattern and indicators for evaluating the convenience of public cultural services. The scientific selection of the index system, the exploration of the accessibility measurement method, the mastering of the spatial pattern and the development status of rural public cultural services, and the identification of the supply and demand of public cultural services will provide theoretical support for further improving the rural public cultural service system and optimize the development of public cultural services.

In terms of medical service, choosing the service facility that takes the least time to receive the service can improve the timeliness of medical assistance. In terms of receiving education, it will reduce the transportation cost and reduce the burden on families. From this perspective, it is meaningful to evaluate the rationality of the spatial layout of service facilities by using the shortest time as the accessibility index. Lin Kang, Han Yanhong and Zhang Li developed a path selection information system based on the shortest time to generate an accessibility isochronous map to obtain the shortest time and the path passed to evaluate the accessibility of hospitals and senior high schools in the city[7].

The increasing maturity of GIS spatial analysis technology and its open source have been widely used in the study of spatial accessibility measurement of public service facilities.

### **1. Network analysis**

Han Zeng Lin used the minimization impedance and maximization coverage models to simulate the accessibility of street elementary schools in urban-rural neighborhoods and to optimize the siting of new facilities[8]. Based on the county public service facility hierarchy, Sun Yu Kang analyzed the spatial accessibility of medical facilities in the county, township and village based on time and distance[9]. He constructed a facility configuration evaluation system

with three major elements: spatial accessibility, service quality, and residents' needs and choices. Based on the public transportation network, Hou Songyan divided peak and non-peak hours and calculated the shortest reachable time to measure the spatial and temporal distribution characteristics of accessibility between hospitals and residential communities in the city[10]. Ke shuai calculated the average response time based on the shortest path as an accessibility measure to evaluate the accessibility of rural residents under the current spatial configuration of ambulances[11]. Li Baojie used distance accessibility, time accessibility model and accessibility coefficient to measure the spatial accessibility of urban and rural transportation infrastructure in urban areas based on the shortest distance and shortest time as indicators.

## **2. Spatial analysis**

Shang Zhengyong analyzed the spatial pattern distribution of accessibility of urban functional land based on the least time cost and mapped accessibility isochrones. Based on the centrality of a transportation network, Chen Chen used the proximity and intermediate of transportation network nodes as accessibility measures, while regression analysis of centrality and distance was conducted to study the spatial accessibility of large general hospitals in central urban areas. Using the buffer zone analysis method, Chen Li used the walking distance of 500m and the riding distance of 1000m as the buffer radius to calculate the number of service facilities within the range as the accessibility index. Jiang Haining evaluated the spatial accessibility of civil airports by drawing accessibility diffusion diagrams based on the average shortest access time[12].

Research on accessibility based on the gravity model has been conducted by some Chinese scholars. To measure the spatial accessibility of medical services in the county, Wu Jianjun chose five accessibility models: proportional model, nearest distance model, opportunity accumulation model, gravity model and improved gravity model to analyze per capita medical resource allocation, nearest distance to medical treatment, opportunity to choose hospital and convenience of medical treatment. When planning public service facilities, it is necessary to consider not only the number of service facilities but also the capacity size of each facility. The factors influencing the accessibility of public cultural facilities should also be considered as much as possible to ensure that the accessibility analysis is more appropriate to the actual situation. Using the improved potential model, Ding Qiuxian incorporated the hierarchical scale of elderly facilities into the model and considered the effect of distance attenuation to divide the service radius of facilities of different hierarchical scales to analyze the spatial accessibility of elderly facilities in urban townships and streets[14]. Song Zhengna used the improved potential model to measure the spatial accessibility of medical facilities in the county by integrating the influence factors of

service facility scale level, facility service capacity, distance to travel impedance (distance or time), and service population size as indicators. Xiong Juan quantified personal behavioral preference factors and used them together with distance and service capacity of supply points as indicators, and applied the improved gravitational force model to measure the spatial accessibility of medical facilities in the county[15].

The accessibility study based on the two-step moving search model can be summarized as follows. Shaoying Zhong used the two-step moving search method to calculate the spatial accessibility of municipal medical facilities by incorporating the scale variables of facility levels into the model and using the integrated road network composed of different levels of highways and subways as the basis for distance calculation. Based on the number and scale of supply and demand points and the distance between supply and demand, Wang Qi quantified the effect of distance decay in the model by Gaussian equation and used Gaussian two-step moving search method to evaluate the spatial pattern of employment accessibility in the urban area. Ren Ruohan used this method to study the spatial pattern distribution of accessibility of educational resources in poor areas by adding traffic and terrain influence factors.

Many current research results show that the research on the accessibility of public service facilities mostly focuses on hospitals, schools, green areas, parks, bus stops and other types of service facilities, but less on public cultural service facilities. The technical aspects of public service facility accessibility studies are more mature and have provided a systematic methodological reference for objective and quantitative descriptions of the spatial characteristics of public cultural service facilities.

## **III. Evaluation of Equalization of Public Cultural Services**

It has always been Chinese government's priority to narrow the gap between urban and rural areas by achieving balanced development. However, the current situation of public cultural service facilities in China's urban and rural areas is that, on the one hand, China's public cultural service facilities are biased toward cities, both in terms of policy and in actual planning, with more supply of public cultural service facilities in cities and a more reasonable spatial layout. On the other hand, under the long-term policy bias, there is a serious shortage of public cultural service facilities in rural areas, and the current tax sharing system makes local governments unable to support the construction of public cultural service facilities. After the Eighteenth National Congress of the Communist Party of China in 2012, the central government of China put forward the requirement of "promoting the equalization of public services" and made it the primary goal of "the overall improvement of people's living standards". A large number of researchers and scholars

in various fields began to focus on the equalization of public cultural services from different perspectives. Among them, human geographers have conducted spatial simulation studies on the issue of equalization of public services based on the perspective of spatial paths of urban-rural integration. Han Zeng Lin used information entropy as an index of equalization to measure the degree of equalization of basic public services in provincial urban and rural areas[17]. Moran's I index was used to analyze the spatial pattern of equalization. Based on the evaluation index system of basic public service equalization, Pi Can used hierarchical analysis and Spearman's correlation analysis to measure the spatial distribution pattern of basic public service equalization within urban units. His research was conducted with the use of correlation coefficients, direct effect coefficients and decision coefficients through path analysis to explore the driving factors of its development and change. Based on the constructed rural public service index system, Song Xiaojun used the imbalance index model and entropy value method to measure the spatial differences in the development level of rural public services in prefecture-level cities. Based on the designed index system for measuring the level of basic public services, Ma Huiqiang used the entropy value method to measure the characteristics of spatial differences in the quality of basic public services in cities above the prefecture level.

#### IV. Conclusion

The focus and difficulty of establishing a sound basic public service system in China lie in rural areas, and the key to promoting the equalization of basic public services also lies in rural areas. As an important part of the basic public service system, the level of development and the degree of construction of public cultural services are not only related to the realization of the basic cultural rights of the majority of farmers but also affect the realization of social equity as a whole.

Geographers have conducted a lot of research on the accessibility of public service facilities and the equalization of public services based on the perspective of the human-land relationship. The common feature is to analyze the accessibility and equalization of a specific type of public service facilities, to understand the current spatial pattern of service facilities, to evaluate the spatial balance of facility distribution, to identify the scarcity areas of facility supply, and to optimize the overall deployment pattern by selecting sites for new facilities with other measurement methods. In terms of the research area, there are more large-scale spatial accessibility studies in favor of urban areas, but few studies specifically focus on accessibility in rural areas; there is also a lack of research on the spatial pattern of equalization based on the rural perspective. In terms of research content, on the one hand, in the field of public service facilities research, there are more studies on the spatial accessibility and

equalization of medical, school, green space, transportation and other facilities, while there are fewer studies on the topics related to public cultural service facilities. At present most scholars consider public cultural services as part of public services, and they usually choose the number of books owned per 10,000 people as one of the indicators for measuring the level of public services for overall research. Little attention was paid to the diversity of public cultural forms. On the other hand, research on public cultural services is mainly conducted from the perspectives of finance and political economy, and is mostly a theoretical hypothesis, with only a few studies conducted from a spatial perspective. In terms of research methods, scholars have conducted a lot of empirical studies on the basis of existing accessibility measurement methods, ranging from potential models to two-step moving search models, from the use of GIS spatial analysis tools to the increasingly complex supply-demand and spatial relationships. The current research has developed various methods to optimize accessibility measurement models. As for the spatial equalization evaluation, further expansion is needed to explore more measurement methods. In conclusion, for reasons of data accessibility and development orientation, the current research on accessibility and equalization of public cultural services takes urban areas as spatial carriers, with an obvious "urban bias" and fewer rural cases. From the perspective of public service facility types, medical and education are the main research objects, while cultural service facilities are less involved. Therefore, research on the spatial accessibility and equalization of public service facilities should be extended more to cultural facilities, especially the spatial equity of public cultural service facilities in rural areas. The focus should be on how to visually express the layout of public cultural services as well as comprehensively consider factors such as the location of rural settlements, distance to facility sites, transportation networks, travel modes, and choice preferences. It is suggested to introduce the analysis of multiple quantitative indicators of accessibility into the planning and construction of public service facilities to further strengthen the realism and scientificity of public service facility planning. Reasonable site selection and optimization of layout patterns for public cultural facilities is also a key factor to improve the construction of a basic public service system in rural areas.

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