Literature Review on the Research Status of Transportation Poverty Alleviation

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ABSTRACT

Since the 18th National Congress of the Communist Party of China, the Party and the government have attached great importance to the role of transportation construction in poverty alleviation, requiring attention to the construction of rural roads and giving play to the leading role of transportation in poverty alleviation. Transportation plays a positive role in poverty alleviation. Accelerating the implementation of transportation poverty alleviation and poverty alleviation is the key to breaking the bottleneck of economic and social development in poverty-stricken areas. It is also an important measure to expand domestic demand and promote the development of transportation itself. It has important strategic significance for building a moderately prosperous society in an all-round way. Although transportation poverty have breakthroughs alleviation, there are still many problems. The establishment of a good and appropriate measure of the valid of transportation poverty alleviation can provide guidance for the construction of transportation poverty alleviation. Therefore, this paper will sort out the research status of transportation poverty alleviation according to the relationship between transportation and poverty alleviation, mechanism of action, existing problems, and performance evaluation.

Keywords: *Transportation poverty alleviation, Mechanism of action, Performance evaluation, Measurement index.*

1. INTRODUCTION

Transportation poverty alleviation has gone through several stages of development, from making up for shortcomings in transportation infrastructure to considering linkage with industries, then to the in-depth promotion of transportation + industry poverty alleviation, and finally developing into an important strategy for transportation to support rural revitalization.

At present, although Chinese rural transportation infrastructure construction has achieved breakthrough achievements, in some deeply impoverished areas, transportation infrastructure is still an obstacle and shortcoming of poverty alleviation work. Most of the deeply impoverished areas are old revolutionary base areas, ethnic areas, and frontier areas. Transportation is still an important factor restricting local economic and social development [1]. Transportation is a restrictive factor for the development of poverty-stricken areas, and it is also a key factor for poverty-stricken areas to get rid of poverty. How to make good use of transportation as a tool to achieve the national strategic goal of poverty alleviation is a lot of research.

The positive effect of transportation on poverty-stricken areas is not only as simple as being convenient for residents and facilitating the sales of agricultural products to the outside world, but there are more complex mechanisms of action, including direct and indirect effects. At present, the state and government attach great importance to the basic and leading role of transportation infrastructure in poverty alleviation and development, but there are some problems in the construction process. Such as failure to consider the combination of construction and needs of residents, road construction is easy but difficult to maintain. Without paying attention to balance and fairness, and without considering the factors of aging, these issues should be included in the indicator system for measuring the effectiveness

of transportation poverty alleviation. In addition, the effect measurement of transportation poverty alleviation projects is an important reference basis for measuring transportation construction funds, construction efficiency, and poverty alleviation effects.

2. THE RELATIONSHIP BETWEEN TRANSPORTATION AND POVERTY ALLEVIATION

"If you want to get rich, it is suggested to build roads first." With the development of the economy and society, people have seen the importance of transportation infrastructure in economic development. The academic community has done a lot of research on the relationship between transportation and poverty. Scholars have reached a consensus on the negative correlation between transportation development and poverty. Many studies have demonstrated the positive correlation between highway construction and poverty alleviation from the perspective of theoretical research, and discussed the interaction mechanism.

There are positive and negative effects on the relationship between transportation and poverty alleviation. On the one hand, the development of transportation infrastructure and the accessibility of transportation in poverty-stricken areas will promote the development of local economy. Zhao Jintao believed that there are three understandings of the relationship between transportation and economy. The first understanding mainly believes that transportation caused by regional economic development. Second, the development of transportation is to meet the transportation needs caused by regional economic activities; the second understanding is that the development of transportation can promote regional economic development, emphasizing and highlighting the role of transportation in regional economic development. The third, the cognition is the synthesis of the first two kinds of cognition, and the transportation is not only the cause of the regional economic development, but also the result of the regional economic development [2]. No matter what kind of understanding reflects the strong positive correlation between transportation and economic development, in other words, transportation also has a positive effect on poverty alleviation. Dai Dongchang believed that transportation is an important area of poverty alleviation and development, and it is the basic and leading condition for poverty alleviation [3]. Shu Mingxin pointed out when studying the historical development context of transportation in the western region of the United States, because of the recognition of the importance of transportation infrastructure to the Appalachian region, Congress specially established the "Appalachian Development Highway System" [4]. Road connectivity is catalytic for economic and social development and poverty reduction in rural areas [5]. Xiang Aibing and Li Mingliang believed that transportation development has direct and indirect effects on poverty reduction, for example, improved transportation in poor areas directly reduces poverty, and transportation drives economic growth to reduce poverty [6].

In the research on the measurement of specific transportation and economic development, Parikh et al. measured the impact of road traffic on the income level of five slums in Maharashtra, India, etc. The results show that every 1% increase in road mileage can bring Revenue rose 0.36% [7]. Xiang Aibing and Li Mingliang believed that transportation development has direct and indirect effects on poverty reduction: improved transportation in poor areas directly reduces poverty, and transportation drives economic growth to reduce poverty [8]. Jian Xiaofeng and Liu Dingshuo studied the relationship between transportation and poverty based on structural equation model. They pointed out that the improvement of poverty degree positively correlated with traffic segmentation and poverty segmentation, and the coupling strength of regional spatial poverty degree and transportation accessibility is 0.23, showing a significant negative impact [9].

On the other hand, unlike the above viewpoints, transportation development and accessibility evolution are not omnipotent in promoting economic development and reducing poverty, and it has the negative impact of transportation accessibility development. The development of transportation infrastructure has accelerated the flow of population to economically developed regions and inhibited economic growth in less developed regions [10]. Due to factors such as the investment environment, the degree of urbanization, and the quality of human capital, transportation development will accelerate the flow of population to economically developed regions, leading to the outflow of workers and human capital, inhibiting economic growth in backward regions, and even producing a "Matthew effect" that further Widen the gap between rich and poor.

3. THE MECHANISM OF TRANSPORTATION POVERTY ALLEVIATION

There are two main modes of action mechanism of transportation poverty alleviation: direct and indirect. Direct effect refers to the direct effect of traffic on poverty-stricken areas and poor populations, improving local transportation infrastructure and improving residents' satisfaction. The mechanism of indirect action is transportation infrastructure—promoting economic development — reducing poverty, improving the level of economic development through the spatial overflow effect of transportation, and achieving the goal of poverty reduction.

3.1 Direct Effect

Zhang Hongtao and Li Hongchang believed that the mechanism of the role of transportation facilities in poverty alleviation in China's rural areas lies in the direct effect of the construction of transportation facilities on poor areas and the poor population [11]. Traffic construction in impoverished areas plays an indispensable role in ensuring villagers' travel and economic and social development. Village and group roads are public goods and closely related to the daily production and life of villagers [12]. It can be seen that the construction of transportation infrastructure plays a direct role in poverty-stricken areas.

3.2 Indirect Effect

Academia has done a lot of research on indirect effects on the mechanism of transportation poverty alleviation, mainly focusing on "transportation infrastructure-economic growth-poverty reduction effect" to study the interactive relationship between transportation and poverty. There are various types of internal mechanisms and complex and changeable relationships, which can be divided into the following categories: convenient transportation — exporting agricultural products — reducing poverty; improving transportation — increasing migrant workers—reducing poverty; accessibility—non-agricultural development - Reduce poverty.

The development of every civilization is inseparable from the blessing of a specific mode of transportation. The progress of transportation mode has caused great changes in the relationship between time and space, which in turn promotes the improvement of productivity and the change of production methods [13]. Gong Weijin et al. verified the obvious effect of transportation poverty alleviation on breaking the spatial poverty trap by constructing an empirical model based on the dynamic space Durbin model (DSDM). In terms of mechanism, transportation poverty alleviation has a spatial overflow effect and obeys the law of spatial distance attenuation; Poverty alleviation has both short-term and long-term poverty reduction effects; and there are interactions with other poverty reduction factors [14].

3.2.1 Accessible Transportation — Non-Agricultural Development — Poverty Reduction

The development of the tourism economy in the western region is sensitive to various transportation infrastructures (railway facilities, expressway facilities, first-class highway facilities, second-class highway facilities, and civil aviation routes) except inland waterways [15]. Therefore, the improvement of transportation infrastructure is conducive to stimulating the development of tourism in poverty-stricken areas and helping the development of poverty alleviation. Taking the current situation of Guangxi's tourism transportation development as an example, Zhao Minglong believed that the impact of transportation on Guangxi's tourism development mainly includes four aspects: the development of Guangxi's tourism resources, the formation of tourism industry, the improvement of the popularity of tourist attractions and the development of international tourism [16].

3.2.2 Improved Transportation — Increased Migrant Workers — Reduced Poverty

By resolving the contribution rate of different income sources to the Gini coefficient of total income, Zhang Yongli also found that income from employment is the main cause of income inequality among farmers, followed by non-agricultural business income, and agricultural income and transfer payments have a lower contribution rate to inequality [17]. The scale of workers migration has a negative impact on the agricultural income of farmers, but it significantly increases the per capita income and altruistic income of the family [18]. Although many scholars have shown through empirical research that population mobility can increase residents' income, but cannot narrow the income gap, it has no alleviation effect on poverty.

However, encouraging workers who go abroad to bring advanced technology back to the region. They start use their own businesses in the region, make full use of the conditions of population flow and the accelerated flow of modern information, and improve the level of local human capital and technology, including the level of agricultural production technology, can reduce gap with developed regions [19].

3.2.3 Facilitation — Agricultural Development — Poverty Reduction

Li Zongzhang used the stochastic production function model to study the impact of highway, wharf and railway construction on the technical efficiency of agricultural production. He pointed out that the popularity of waterways and highways has a significant role in promoting the technical efficiency of agricultural production in various provinces in China [20]. An efficient transportation system was necessary for the development and promotion of economic growth, as it performs the following functions: provides physical access to resources and markets, thereby facilitating the efficient marketing of agricultural products, industrial specialization, and the simultaneous expansion of production and employment [21]. Therefore, the construction of transportation infrastructure has an important impact on the development of agricultural production in my country. At present, the research on the impact of transportation infrastructure on agricultural production mainly focuses on agricultural economic growth, agricultural productivity, agricultural production inputs [22], and agricultural production costs [23].

E-commerce poverty alleviation is mainly a new type of online transaction method using Internet sales. It breaks geographical restrictions, integrates regional advantageous resources, reduces the transaction cost of agricultural products, and increases the income of farmers in poverty-stricken areas [24]. E-commerce has become a new engine for rural economic development, continuously expanding the sales channels of characteristic agricultural products, increasing farmers' income, reducing agricultural production costs, promoting rural economic development, and stimulating rural employment and entrepreneurship, as well as e-commerce poverty alleviation [25]. For the development of e-commerce, the most important infrastructure construction is nothing more than traffic construction and network construction [26]. Transportation is an important threshold for the development of e-commerce. Improving transportation accessibility and building a comprehensive transportation network are the goals that the transportation + e-commerce industry must solve, and it is a development direction for future.

4. PROBLEMS EXISTING IN TRAFFIC POVERTY ALLEVIATION

At present, although my country has vigorously developed transportation facilities in impoverished areas, there are still many problems and difficulties in the transportation infrastructure in impoverished areas. Reasonableness, insufficient depth, lack of post-maintenance capability, insufficient passenger volume of the line, and low service quality still exist. The existence of these factors largely restricts the play of traffic spillover effects.

4.1 The Construction Does Not Meet the Demand

Settlements connect to the nearest road or village, whichever is closer, which does not ensure access to basic needs. Therefore, transportation construction should not only be based on planning, and should no longer be based on the needs of poor areas (ie, population), but also consider other comprehensive factors. Wang Honggang and Li Yanchun pointed out that the construction of road traffic has always been the focus of poverty alleviation. In the future, it is necessary to further strengthen the precision of traffic poverty alleviation, strengthen the key construction of road traffic, strengthen the key construction of road traffic, and adhere to the development of green road traffic [27].

4.2 Difficulties in Later Operation and Maintenance

Xiang Aibing and Li Mingliang pointed out that there are four problems in poverty-stricken areas: insufficient effective transportation supply, prominent traffic safety problems in poverty-stricken areas, unbalanced supply and demand of transportation funds in poverty-stricken areas, and difficulty in public passenger transport services in poverty-stricken areas. When Nie Xin studied the rural traffic situation, he pointed out that the main reasons for the lack of passenger cars entering the villages included poor road conditions in rural areas in mountainous areas, young and middle-aged

people go to school and work, a large number of people leave the rural passenger line [28]. Therefore, all departments should expand their work horizons, consolidate the achievements of poverty alleviation, and increase support in the following aspects: reducing costs and increasing efficiency, subsidizing rural passenger routes, and opening uncommon routes.

Wu Zhonghao pointed out in a case study on the basic situation and main problems of highway construction in Chongyi County that the road network is imperfect, the depth of smoothness is not enough, the construction quality needs to be strengthened, and the level of road maintenance is not high [29].

4.3 Equity and Equilibrium

Under the background of advocating transportation poverty alleviation, the development of poverty-stricken areas is gratifying, but due to the current inclination of policy brought many problems. There are three impacts, affecting the improvement of the overall service capability of the road, affecting the experience of different objects, and affecting the formation of the regional linkage pattern [30]. Coincidentally, Chen Zhouxiang and others believed that the coordinated development of railways, high-grade highways, different transportation infrastructures and different regions is unbalanced, and there is still much room for improvement in the synergy between transportation development and multiple entities [31].

4.4 Challenges Brought by Aging

With the development of China's aging population and the loss of working-age population in poor rural areas, the proportion of the elderly population continues to increase, and urgently needed sustainable public transportation systems are in poor areas. Rural public transportation services are extremely important to disabled citizens and low-income families because many seniors are unable to drive as they age, making tasks such as grocery shopping, pharmacy visits, and visiting family and friends increasingly difficult [32].

5. PERFORMANCE EVALUATION OF TRAFFIC POVERTY ALLEVIATION

At present, the research on the performance evaluation of transportation poverty alleviation in China is still in its infancy, and lack a scientific and complete evaluation system. As far as the current research on transportation poverty alleviation is concerned, the academic research on transportation poverty alleviation mainly focuses on qualitative analysis, the literature on quantitative research is relatively scarce, and the research and analysis of the combination of the two are insufficient.

5.1 Performance Evaluation Criteria

Although the previous article also based on the research of various experts and scholars, it demonstrated that transportation development and poverty alleviation are positively correlated and poverty-stricken, but this does not mean that the more transportation lines, the higher the overall economic benefits of poverty. At present, in response to the call of the state, many impoverished counties and actively develop transportation, strive to "remove their hats", and implement "flooding irrigation" of transportation construction in the early days of the founding of the People's Republic of China. Under the condition of backward transportation infrastructure in poverty-stricken areas, "flooding irrigation" is reasonable to a certain extent, but many areas have copied the model, the design of transportation projects is not accurate, and the need for poverty alleviation in different areas is not accurately grasped [33]. For the later road maintenance issues, the issues such as incomplete consideration are not considered. Should evaluation focus on the accessibility of transportation or the accuracy of transportation demand? On this issue, whether to focus on efficiency or fairness, there is currently no clear definition in the academic world.

Dai Dongchang paid attention to the efficiency of capital use and the efficiency of transportation construction when measuring the effectiveness of transportation poverty alleviation [34]. Ma Kuijie and others believed that the effectiveness of transportation poverty alleviation reflected in the improvement of road travel conditions in poor areas and the improvement of road transportation service levels [35]. Yan Xin measured the efficiency of resource utilization and the sustainability of the

effect of transportation in poverty alleviation projects.

5.2 Performance Evaluation Methods

Wang Hualan used the weight value of the indicators to indicate the impact of each indicator on the performance of transportation poverty alleviation, and used the AHP weighting method to determine the weight value. The results showed that the performance of the rural transportation in poverty alleviation model in Gansu reflected in the saving of time and cost of agricultural products outbound transportation and the increase of agricultural products outbound transportation volume [36]. In order to examine the importance of the primary indicators in the evaluation of poverty alleviation performance, Yan Xin et al. used the Delphi method to re-examine and filter the evaluation indicators, and invited experts in the field of transportation to score the importance (ie "weight") of each indicator.

Jiang Li used the Cobb-Douglas production function to measure the performance of transportation poverty alleviation, $Q = AL^{\alpha} P^{\beta} G^{\gamma} M^{\delta}$, where Q represents the elastic output of poverty, A represents the technical level, L represents the investment in rural highways, and P represents the construction of the road network and the installation of county roads. Input, G represents the investment in the construction of the passenger station, M represents the investment in the construction of county roads, township roads, special roads, and village roads, α, β, γ, and δ represent the production elasticity, $\alpha + \beta + \gamma + \delta \approx 1$. [37]

Liao Fuchong first used the OLS estimation method to dissect the impact of transportation infrastructure on household income, and then used logit regression to dissect the nonlinear relationship between transportation infrastructure and the incidence of poverty using the maximum likelihood estimation method (ML). And the propensity value is adopted to dissect the causal link between transportation infrastructure and household income [38].

5.3 Performance Evaluation Indicators

Many domestic scholars have put forward relevant principles for the construction of the evaluation index system for transportation poverty alleviation. Generally, there are generally the following principles: scientific principle, systematic and comprehensive principle, hierarchical principle, representative principle, and operability principle. At present, there are mainly two types of researches on the evaluation indicators of transportation poverty alleviation in the academic circle.

From the perspective of poverty alleviation effect, poverty alleviation efficiency, and sustainable development ability, Yan Xin et al. established the evaluation index system of transportation poverty alleviation by using the analytic hierarchy process [39]. Wang Binglan evaluated the performance of transportation poverty alleviation from five indicators: transportation project construction funds, people's living standards (people flow, logistics, capital flow, information flow), agricultural industry structure, tourism development and ticket growth, and the number of new jobs [40].

Jiang Li measured the poverty of the county-level contiguous poverty-stricken areas from several indicators including economic poverty, human poverty (four dimensions: education poverty, housing poverty, social poverty, and health poverty), transportation poverty, and ecological poverty.

6. CONCLUSION

In terms of research content, the current research on transportation poverty alleviation mainly focuses on the overall research on development planning, development direction, policy recommendations, etc., as well as the summary of the practical experience of transportation poverty alleviation and the discussion of future development ideas. A large number of scholars have demonstrated the positive correlation between transportation development and economic development, but few scholars have measured the poverty reduction effect of transportation in poverty alleviation projects.

On the indicator dimension of measuring transportation poverty alleviation, most analytical models focus on a single objective, such as project fund efficiency, per capita GDP, transportation distance or time, without jointly considering resource scarcity and equity.

In terms of research methods, the related research on transportation poverty alleviation in academia mainly focuses on the qualitative research level, and the use of quantitative methods is less.

AUTHORS' CONTRIBUTIONS

This essay is independently completed by Chunfang Huang.

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