Regional Characteristics and Causes of Farmers' Poverty in the Perspective of Agricultural Development

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Abstract

In recent years, although China's poverty alleviation and development work has achieved remarkable results, the proportion of poor families in China is increasing from the east to the west, and there are some differences in poverty-causing factors in different regions. Therefore, the author decomposes the results of multi-dimensional poverty measurement according to region and dimension. The analysis results show that there are regional and ethnic differences in multi-dimensional poverty, and the multi-dimensional poverty situation in rural areas in the west is more severe. The most serious problems faced by poor farmers are education, topography, natural disasters, and fixed assets. Therefore, accurate poverty alleviation is inevitably one of China's poverty alleviation strategy. Accurate poverty alleviation is also an inevitable requirement for improving the quality of poverty alleviation.

Key words: Multidimensional Poverty Measurement; Precise Poverty Alleviation; Rural Areas in Western China; Regional Characteristics and Causes of Poverty.

1. Introduction

Since the reform and opening up, although China's poverty alleviation and development work has made significant progress, the number of absolute poor people has declined on a large scale [1]. In 2015, the decision of the Central Committee of the Communist Party of China and the State Council on "Winning the Poverty Alleviation" made education poverty alleviation an important part and priority of the national poverty alleviation and development plan [2]. The reason for the implementation of this policy is: “For a long time, China’s poverty alleviation and development has problems such as unclear population of the poor, unclear situation, lack of pertinence, poverty alleviation funds and project inaccuracy” [3]. Of course, we have noticed that the economic and social gap in western China has been expanding for a long period of time, which has weakened the poverty alleviation effect of economic and social development in general, and has shown a trend of marginal decline [4]. With the opening of reform and opening-up, the reform of economic system not only brings about the improvement of productivity, but also solves the problem of food for more and more people. Ten years of reform and opening-up has helped half of the rural population get rid of poverty [5]. Therefore, it is of great significance to grasp the regional characteristics of regional poverty, analyze its causes and construct a targeted and precise poverty alleviation path on this basis for improving the effectiveness of poverty alleviation and accelerating the process of poverty alleviation [6].

In November 2013, General Secretary Xi Jinping first put forward the concept of "precise poverty alleviation" during his visit to Western Hunan, pointing out that "poverty alleviation should be realistic and tailored to local conditions". It is our common ideal to build a well-off society in an all-round way and achieve...
common prosperity, and the way to achieve this goal and ideal is precise poverty alleviation [7]. It is our common ideal to build a well-off society in an all-round way and achieve common prosperity, and the way to achieve this goal and ideal is precise poverty alleviation [8]. However, because the vast majority of the poor people in China are concentrated in rural areas, the agricultural production conditions and natural ecological environment in different rural areas are quite different. Some rural areas with good agricultural production conditions and natural ecological environment have gradually been out of poverty [9]. However, there are still large areas of poverty in areas with poor agricultural production conditions and poor natural ecological environment, and the problem of regional poverty in rural areas is prominent [10]. Promoting the scientific and cultural quality and vocational skills of the masses in poor rural areas, enhancing the ability to get rid of poverty and become rich, and promoting the industry and employment in poor rural areas, are the needs of the transformation and development of adult education in poor rural areas, and become an effective breakthrough in the precise poverty alleviation of Education [11]. There are many reasons for the emergence of poor people in China. One of the important causes is "poverty caused by illness, poverty returned due to illness" [12]. This also means that the poverty alleviation goals, requirements and tasks in the new era are changing from a single dimension to multiple dimensions [13].

Since 1949, the tasks and objectives of poverty alleviation in China have been changing with the development of our country. The essence of poverty alleviation lies in refinement, and the winning way to eradicate poverty completely lies in quasi [14]. Therefore, this study is of great significance to the study of poverty alleviation in rural areas by precisely analyzing the target population, analyzing the characteristics of poverty and putting forward targeted countermeasures [15]. In the context of rapid economic development, the imbalance between regional and intra-regional development has also begun to enter the vision of policy makers. In the past, the government-led development-oriented poverty alleviation strategy often has targeting deviations in the process of implementation. Many important poverty alleviation and development projects face the challenge of insufficient ability to reach the poor and low-income groups [16]. In 2013, along with the concept of "precise poverty alleviation", China's rural poverty alleviation work entered the sprinting stage of tackling difficulties, and required poverty alleviation work to target different types of poverty and poverty-stricken areas [17]. Although the past extensive poverty alleviation policy played an important role in China's poverty alleviation work, the causes, extent and impact of poverty caused by different regions, different disease types, different medical payment mechanisms and related health policy adjustments are not the same. Therefore, driving poor people in backward areas to get rid of poverty and get rich is related to the overall situation of the strategy. It is not only a political and economic issue, but also a high-profile social and livelihood issue [18].

2. Methodology

In the early days of the founding of New China, the main task of poverty alleviation was to solve the problem that as many as 250 million people in rural areas in China were not enough to eat and not to wear warm [19]. Summarizing China's anti-poverty process over the past 30 years, we can see that under the leadership of the government-led development-oriented poverty alleviation strategy and the state-constructed social security system, China's rural poor population is driven by the rapid development of the national economy and society. Continue to decrease faster [20]. China's research on rural poverty based on geography is relatively late. The research content and direction focus on the spatial heterogeneity and causes of poverty, the identification and measurement of poverty in rural areas, and the construction of poverty alleviation policies and institutional mechanisms. Some scholars also discussed the relationship between rural poverty and new urbanization [21]. As far as the poverty-stricken population in rural areas is concerned, the income poverty of ethnic minorities and minority areas is more severe than that of Han and other areas. At present and in the future, the formulation and implementation of China's precise poverty alleviation strategy needs to take the Multidimensional Poverty of the rural poor as the starting point. Since migrant workers are basically high-quality labor force in rural families, whether migrant workers can get rid of poverty through urban efforts determines to a certain extent that the rural families behind them can get rid of poverty [22]. Due to the special dietary habits, geographical characteristics, health awareness and other reasons, poverty in the western minority areas of China is higher than that in the eastern areas and urban areas. On the whole, the current domestic related research is rising rapidly, but mostly concentrated on the national and provincial, typical regional scale, and pay insufficient attention to the problem of rural poverty at the regional level [23].

The continuing outflow of the rural population, especially the young and middle-aged, in the western region is the main cause of rural poverty in this region. Fig. 1.
Over the years, our government and relevant agencies have taken a series of measures to reduce the rural poverty in China, such as poverty alleviation. However, the data show that the overall rural poverty problem in China still needs to be alleviated and further efforts are urgently needed. Figure 2 is a survey of the number of rural poor in China from 2015 to 2018 (unit: 10,000 people).

Setting $C$ as deprivation dimension, the calculation formulas of poverty incidence, average deprivation share and multi-dimensional poverty index are as follows:

$$ c_{\text{max}} = c \left( j_n, m \right) $$

(1)
If the study area can be divided into a region and the sample size of each region is h, then the multi-dimensional poverty index can be decomposed by Region as formula (2), and the contribution rate of each region as formula (3), pp.

\[ a_i = \left( \tau_i - \tau_{i-1} \right) / \left( \rho_i h_i \right) \]  
\[ l = (i, x, y) \]

(2)

(3)

Dimensional poverty index can be decomposed as follows:

\[ z_i = v_i \cdot x + t_i \]  

(4)

In formula 4, \( V \) denotes the poverty index on dimension i, then the contribution rate of dimension I to the multi-dimensional poverty index can be expressed as follows:

\[ v_D = \eta \frac{u_i R_{oN}}{D} i(t) \]  

(5)

Individual X represents consumption before payment of cash health expenditure by M on behalf of poverty line A. The incidence of poverty can be expressed as:

\[ M_{ab}(\psi) = \{ \psi_{j,i,a}(x) = \det A \}^{1/2} \psi(B^A x - k), j, \ell \in \mathbb{Z}, k \in \mathbb{Z}^2 \]  

(6)

The author makes regional statistics on the number of poor families and non-poor families in the eastern, central and western regions of China, and finds that the number of poor families on the map of the western region is relatively large. See Table 1.

### Table 1. Statistics of Poor Families

<table>
<thead>
<tr>
<th>Region</th>
<th>Poor families</th>
<th>Non-poor families</th>
</tr>
</thead>
<tbody>
<tr>
<td>East</td>
<td>1984</td>
<td>1432</td>
</tr>
<tr>
<td>Central section</td>
<td>1725</td>
<td>2845</td>
</tr>
<tr>
<td>West</td>
<td>2453</td>
<td>1963</td>
</tr>
</tbody>
</table>

Referring to the index system proposed by other scholars at home and abroad, a multi-dimensional poverty measurement index system for the poor population in ethnic minority areas is established, as shown in Table 2. The adjusted dimensions, index variables and their deprivation thresholds are reported in the table.

### Table 2. Dimensions, Indicators and Critical Values of Multidimensional Poverty Measurement in Ethnic Areas

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Index Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>Average Educational Years of Family Labor Force (1/8) If the average workforce in</td>
</tr>
<tr>
<td></td>
<td>the family receives If the length of education is less than 6, the value will be</td>
</tr>
<tr>
<td></td>
<td>1, otherwise it will be 0.</td>
</tr>
<tr>
<td></td>
<td>Communication or literacy (1/8) If the communicative ability of the head of house</td>
</tr>
<tr>
<td></td>
<td>hold in spoken Mandarin is &quot;basically no&quot;, or the reading and writing ability of</td>
</tr>
<tr>
<td></td>
<td>the head of household in Chinese is &quot;basically no&quot;, then the value is 1, other</td>
</tr>
<tr>
<td></td>
<td>wise it is 0.</td>
</tr>
<tr>
<td>Healthy</td>
<td>Situation of disabled persons (1/16) If there is one or more physically disabled</td>
</tr>
<tr>
<td></td>
<td>persons in the family (and affect the normal work, study and life), the value wi</td>
</tr>
<tr>
<td></td>
<td>l be 1, otherwise it will be 0.</td>
</tr>
<tr>
<td></td>
<td>Illness and injury (1/16) There is one or more motive force in the family that af</td>
</tr>
<tr>
<td></td>
<td>fects normal workers because of illness or injury. If the number of days spent w</td>
</tr>
<tr>
<td></td>
<td>orking, going to school or living exceeds 30 days, the value will be 1, otherwise</td>
</tr>
<tr>
<td></td>
<td>it will be 0.</td>
</tr>
</tbody>
</table>

Poverty alleviation is an important manifestation of building a well-off society in an all-round way. Poverty alleviation, coordinated development of urban and rural areas, is also an inherent requirement for achieving common prosperity. Traditional income-based poverty identification and monitoring neglects the essence of poverty and fails to take into account the lack of other abilities of poor households. It is more scientific and reasonable to accurately identify poverty from a multi-dimensional perspective [24]. At the end of the nineteenth century and the beginning of the twentieth century, the poverty alleviation plan for the rural population began to be included in the overall plan of national economic development, and its status became
more and more important. Specific policies, including development-oriented poverty alleviation and special poverty alleviation funds, have led to the participation of social resources. In theory, poverty can be divided into two categories: income poverty and multidimensional poverty. Although the overall quality of farmers is still an indisputable fact, their understanding of learning is no longer the same. Learning to acquire knowledge and skills, and using the knowledge they have learned to help themselves get rid of poverty as soon as possible has become a common understanding of farmers [25]. Although the existing research has explored the spatial differences and influencing factors of regional rural poverty, the regional characteristics of rural poverty are less concerned, and the dynamic understanding of regional rural poverty is not accurate. Due to the relatively backward economic level in the western region, and the lack of control measures against poverty in the economy, the impact on poverty is very serious. Therefore, studying and solving the poverty problem of the migrant workers group can effectively improve the efficiency of poverty alleviation and poverty alleviation, and promote poverty alleviation in rural areas. It is of great significance for doing a good job in poverty alleviation under the new situation and achieving a well-off society in 2020.

According to the 2018 rural poverty monitoring report data, the distribution of poverty population in the eastern, central and western regions of China is as follows:

![Figure 3. Distribution of Poverty-stricken Population in Rural Areas of East, Middle and West China](image)

Using SHES2011 rural data and multi-dimensional poverty AF method widely used at home and abroad, the results of multi-dimensional poverty in the western region are estimated (see table 3).

**Table 3. Multidimensional Poverty Estimation in Western Min Dynasty**

<table>
<thead>
<tr>
<th>K(%)</th>
<th>Incidence of poverty (H,% )</th>
<th>Average deprivation of share(A1, %)</th>
<th>Multidimensional poverty index (M0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>35.2</td>
<td>43.04</td>
<td>17.28</td>
<td>0.147</td>
</tr>
<tr>
<td>41.6</td>
<td>25.18</td>
<td>21.36</td>
<td>0.098</td>
</tr>
<tr>
<td>56.7</td>
<td>13.63</td>
<td>43.57</td>
<td>0.035</td>
</tr>
<tr>
<td>68.4</td>
<td>5.74</td>
<td>58.69</td>
<td>0.013</td>
</tr>
</tbody>
</table>

Multidimensional poverty measurement and decomposition based on regional grouping. Table 4 is the result of the decomposition of the multi-dimensional poverty index by region. It can be found that there are obvious differences in the multi-dimensional poverty of farmers in different provinces and regions.

**Table 4. Multi-Poverty Index Decomposed by Region**

<table>
<thead>
<tr>
<th>Region</th>
<th>Multidimensional poverty index</th>
<th>Multidimensional poverty index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H(%)</td>
<td>M0</td>
</tr>
<tr>
<td>Western Region</td>
<td>74.05</td>
<td>0.1486</td>
</tr>
<tr>
<td>Eastern Region</td>
<td>49.57</td>
<td>0.1568</td>
</tr>
</tbody>
</table>
Average poverty gap: The sum of the poverty gaps for the entire population divided by the total population, reflecting the total poverty level of the population.

\[ \mu_{s,d} = \frac{1}{MN} \sum_{m=1}^{M} \sum_{n=1}^{N} W_{s,d}(m,n) \]  

(7)

Mean positive poverty gap (MPG), pp. The sum of poverty gaps across the population divided by the number of poor people, reflecting the level of poverty among the poor.

\[ \sigma_{s,d} = \left[ \frac{1}{MN} \sum_{m=1}^{M} \sum_{n=1}^{N} \left| W_{s,d}(m,n) \right| - \mu_{s,d} \right]^{1/2} \]  

(8)

Normalized poverty gap (NG), pp. The average poverty gap can reflect the average poverty level of the population, but the use of this indicator alone cannot make international or regional comparisons.

\[ M (\omega) = \frac{w}{D} R_{ON} + (1 - \frac{w}{D}) R_{OFF} \]  

(9)

According to the multi-dimensional indicators, the poverty is decomposed and the contribution of different poverty dimensions to poverty is solved. Thus, there are two mathematical analysis models. The first is a measurement model of multidimensional poverty, whose mathematical expression is:

\[ V_D = \frac{d_w}{d_t} \]  

(10)

The second is the multi-dimensional poverty group decomposition model. In this study, the subjects are divided into two groups, namely, Han and minority nationalities. The mathematical expressions of the model are as follows:

\[ w(t) = w_0 + \eta \frac{D q(t)}{Q_0} \]  

(11)

Since the 18th National Congress, precise poverty alleviation has become the focus of current poverty alleviation and development work. Fifty-two key poverty-stricken counties (state-level) were identified in the seven-year national "87" poverty alleviation plan. In terms of its overall distribution and centralized links, most of the key counties in need of poverty alleviation and assistance have formed centralized links in the whole country. In rural poverty-stricken areas, education can eradicate illiteracy, cultivate new types of farmers, help farmers get rid of poverty and become rich, and prevent the vicious circle of poverty. The redefinition of poverty standards has greatly promoted the development of poverty research theory and anti-poverty practice, which has also become one of the important achievements of the 1998 Nobel Prize in Economics. In addition, the existing research is mostly based on socio-economic statistics, and the lack of mastery of the family situation and income and expenditure structure of the poor groups has affected the accuracy of understanding the characteristics of regional poverty. In many cases, the beneficiaries of poverty alleviation and development projects are often non-poor or poor-stricken groups in poverty-stricken areas. The real poor people are difficult to directly benefit from poverty alleviation and development projects. This reduces the poverty reduction effect of poverty alleviation development projects. For poor residents, support the real poor and achieve a scientific and systematic approach to poverty alleviation. Accurate poverty alleviation is the direct path for the rich to lead the rich and to build a well-off society in an all-round way until the common prosperity.

In order to describe in more detail the poverty level of rural population in China, many researchers try to calculate the incidence of poverty and the rate of poverty gap. The poverty measures calculated here are calculated based on their respective absolute poverty lines. The calculation results are shown in Figure 4.
Figure 4. Single-dimensional poverty index from 2015 to 2018

Figure 5 shows the average annual income of residents in the eastern, central and western regions of China. The western region is significantly lower than the annual income in the eastern and central regions. Therefore, the incidence of poverty in the western region is correspondingly higher.

Figure 5. Annual income survey of residents in the eastern, central and western regions

Tables 5 and 6 report the multidimensional poverty index and decomposition results based on the ethnic grouping in the western region. Obviously, there are obvious differences in the multidimensional poverty of farmers of different nationalities. Considering the differences between the multi-dimensional poverty of all ethnic groups, we can see that the multi-dimensional poverty situation of the Zhuang people in the western region is the most severe.

Table 5. Multidimensional Poverty Index Decomposed by Han and Minority Nationalities

<table>
<thead>
<tr>
<th>Nation</th>
<th>Multidimensional poverty index</th>
<th>Multidimensional Poverty Index Decomposition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H(%)</td>
<td>M0</td>
</tr>
<tr>
<td>Han nationality</td>
<td>57.56</td>
<td>0.0485</td>
</tr>
<tr>
<td>Ethnic minority</td>
<td>84.35</td>
<td>0.1687</td>
</tr>
</tbody>
</table>
Table 6. Multidimensional Poverty Index Decomposed by Ethnic Groups

<table>
<thead>
<tr>
<th>Nation</th>
<th>Multidimensional poverty index</th>
<th>Multidimensional Poverty Index Decomposition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H(%)</td>
<td>M0</td>
</tr>
<tr>
<td>Han nationality</td>
<td>66.85</td>
<td>0.048</td>
</tr>
<tr>
<td>Hui nationality</td>
<td>68.45</td>
<td>0.1547</td>
</tr>
<tr>
<td>Zhuang Nationality</td>
<td>76.54</td>
<td>0.1789</td>
</tr>
</tbody>
</table>

Accurate poverty alleviation is an inherent requirement for realizing urban-rural integration, eradicating poverty, and achieving common prosperity. The poverty dimension considers the breadth of poverty and reflects a deeper understanding and understanding of poverty. The selection of dimensional indicators should not only reflect the local objective conditions, but also facilitate the comparison between them. The level of support, the level of support, and the goals are also established and clarified. In order to achieve accurate poverty alleviation and accurate poverty alleviation, we must first accurately identify them. Only by accurately identifying the poor people, all poverty alleviation policies and poverty alleviation measures can accurately target the poor.

The number of poor people in China has further dropped to less than 100 million. In the mid-to-late twentieth century, China’s large-scale poverty alleviation has begun to bear fruit, and areas with less poverty have basically achieved poverty alleviation at this time. However, the areas with deep poverty and difficulty in getting rid of poverty are still widely distributed. Blind business transformation can also lead to an increase in the probability of poverty, which is reflected in the fact that the probability of household poverty will become higher as the number of commercial appliances that bring economic income to the household increases. Since 1978, the state has adopted three income poverty (poverty alleviation) standards. According to the actual situation of national economic and social development, the income level used by the state to define poverty (poverty alleviation) standards has gradually increased. After the multi-dimensional poverty theory was put forward, the biggest challenge facing many scholars is how to effectively carry out the multi-dimensional poverty measurement. Many scholars have made valuable explorations, but there are some limitations in the applicability and physical characteristics of the method.

Because the outflow of population indirectly affects the growth of poverty rate in different regions, the author investigates the population changes in eastern, central and western regions of China. The specific results are detailed in figs. 6-8. According to the survey, the population change in the western region of China is the most serious. (Unit: 10,000 people).

Figure 6. Change of Population Quantity in Eastern China
3. Result Analysis and Discussion

For a long time, research on poverty and related anti-poverty practices have used income or consumption standards as a single indicator for measuring poverty. Education poverty alleviation is the inclination of public education resources to poverty-stricken areas, optimizing the allocation of educational resources, giving farmers the opportunity to receive education, and improving the scientific and cultural knowledge and ideological and moral level of farmers. This will help them finally get rid of poverty and a way of poverty alleviation. Poor population exists in all provinces, autonomous regions and municipalities directly under the Central Government in China, but the distribution of poverty-stricken populations is relatively concentrated in the central and western provinces (autonomous regions and municipalities), especially in the western regions. Therefore, the analysis and analysis of the causes of poverty in different regions, in order to accurately guide the actual situation in each region and according to the specific problems existing in the local residents, can more effectively implement accurate poverty alleviation. Poverty alleviation through education can promote equity in education and social justice, which is one of the important tasks of the national poverty alleviation and development strategy, and reflects the full play of the country's effectiveness. However, with the progress of economy and society, the development needs of all aspects of human beings are increasingly diversified, and the manifestations and actual connotations of poverty are constantly deducing new characteristics. One-dimensional poverty measurement based on income or consumption alone can hardly fully reflect the human development
beyond the income dimension. It is a realistic need to comprehensively define and identify poverty from multiple dimensions in order to promote the research and practice of anti-poverty theory.

\[ M(\text{q}) = R_0 - \eta \frac{\Delta R \text{q}}{Q_0} \]  
(12)

The adjusted population proportion \( M \) actually includes two different parts: one is the incidence of multi-dimensional poverty \( R \), the other is the intensity of multi-dimensional poverty \( t \), which is the weighted average of deprivation score of multi-dimensional poverty population.

\[ M(t) = u(t) / i(t) = R_0 \sqrt{1 - 2\eta \Delta R \Phi(t) / Q_0 R_0^2} \]  
(13)

To achieve this goal, the \( M \) matrix must be changed into the product of \( M \) and the recognition function \( R \):

\[ M(t) = u / i = R_0 \sqrt{1 - 2\eta \Delta R U_t / Q_0 R_0^2} \]  
(14)

At the beginning of 2014, the central government formulated the strategy of precise poverty alleviation: "Precise poverty alleviation is a new measure after the new stage of poverty alleviation in China, which conforms to the national conditions of China". By designing structured questionnaires, household surveys and questionnaire interviews, the author obtains relevant information about household structure and daily income and expenditure structure of peasant households. On this basis, the regional characteristics of rural poverty in Northeast China and its formation mechanism are analyzed to provide reference for the effective implementation of the precise poverty alleviation strategy. Secondly, it is necessary to establish exit mechanism for poverty-free households. For the first time, China's poverty alleviation work has begun to shift from the large-scale inclusive assistance to the struggle against poverty in the poorest areas. Experts and scholars at home and abroad have conducted extensive research on the selection of dimensional indicators in multidimensional poverty measurement, the determination of poverty subjects, the measurement of multidimensional poverty index, and the comparison between single poverty and multidimensional poverty. Therefore, we must adhere to the implementation of the top and bottom, layer by layer, on the basis of strengthening the top-level design, and plan for poverty alleviation work according to the actual poverty situation in each region. To this end, it is necessary to establish a multi-dimensional poverty index (MPI) indicator system suitable for studying rural multi-dimensional poverty in ethnic areas, and to analyze the current situation of rural multi-dimensional poverty in ethnic areas, and use this as a basis to propose precise poverty alleviation measures in ethnic areas.

It can be seen from Figure 9 that the poverty line in western China is positively correlated with the level of economic and social development. From the above figure, we can understand that the growth rate of China's rural poverty line is far less than the growth rate of per capita GDP, and rural income is increasing year by year. However, it must be noted that the growth rate of China's poverty line is relatively slow, and it is not commensurate with the per capita net income of farmers and the rapid growth of GDP. The adjustment of the rural poverty line is relatively lagging behind.

**Figure 9. Development Trend of GDP, Farmer's Income and Rural Poverty Line in China**
Taking 30 rural households in a village in Western China as an example, the incidence and contribution rate of poverty in each dimension of the sample households in the village are calculated, so that the poverty dimension can be accurately identified. The specific data are shown in Table 7.

<table>
<thead>
<tr>
<th>Dimension index</th>
<th>Income</th>
<th>Education</th>
<th>Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incidence of poverty H</td>
<td>17.8</td>
<td>54.2</td>
<td>12.3</td>
</tr>
<tr>
<td>Dimensional contribution rate I</td>
<td>4.5</td>
<td>34.8</td>
<td>3.8</td>
</tr>
</tbody>
</table>

Reducing poverty and eradicating poverty are important criteria for testing social progress and social harmony. Correct understanding of the internal mechanism, characteristics and distribution of poverty can help the smooth progress of poverty alleviation. Some scholars believe that single-dimensional aiming overemphasizes the target of poverty, while ignoring the aim of the main body, cause, industry, time series, etc., precision poverty alleviation needs to be multi-dimensional aiming transformation. At the same time, the policy has been further targeted and poured into the poorest areas such as the old revolutionary areas, the frontier provinces and some ethnic minority areas. The “human poverty” defined by the United Nations Development Programme is also multidimensional poverty. It not only refers to insufficient income, but also means that many aspects of human development opportunities, rights, health, dignity and decent life are deprived. Foreign scholars have done more in-depth research on the spatial distribution pattern of poverty groups and spatial poverty traps, the role of agricultural development in poverty reduction, poverty assessment and poverty reduction effect evaluation, and the reaction of rural poverty to policy. It also proves that education can improve workers' scientific and cultural quality and vocational skills, enhance labor productivity, provide talents and intellectual support for economic development and social progress, and effectively drive economic growth. Accurate poverty alleviation through adult education in poor rural areas is extremely important.

The author uses questionnaire survey to obtain data. The study takes farmers as the basic unit of analysis, and takes universality and representativeness as the principle in the eastern, central and western regions of China. Sample survey and comparison of the distribution of farmers are conducted. Details are shown in Figure 10.

![Investigation on the Distribution of Farmers' Samples in East, Middle and West China](image)

Based on the content characteristics of CNHS household microsurvey data, the variables shown in Table 8 are selected to explore the causes of rural household regional poverty in Western China.

<table>
<thead>
<tr>
<th>Variable properties</th>
<th>Variable name</th>
<th>Variable meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent variable</td>
<td>P</td>
<td>Poverty or not</td>
</tr>
<tr>
<td>Independent variable</td>
<td>PA</td>
<td>Number of adults in the family</td>
</tr>
<tr>
<td></td>
<td>PC</td>
<td>Number of minors in the family</td>
</tr>
<tr>
<td></td>
<td>PN</td>
<td>Total number of households</td>
</tr>
</tbody>
</table>
Chinese academia is paying more and more attention to multi-dimensional poverty. Some scholars began to explore and establish multi-dimensional poverty indicators adapted to China's national conditions, and carried out empirical research. Their results show that nearly one fifth of urban and rural households in China suffer from poverty in any three dimensions beyond their income, and their multi-dimensional poverty is more serious than that in the simple income dimension. In the twenty-first century, the characteristics of poverty alleviation in China are becoming more and more prominent, such as the orientation of poverty alleviation and the cultivation of the development capacity of poverty-stricken areas. Since then, the measurement standards have become more and more diversified. Researchers consider that the lack of other factors can also make people in poverty besides the means of livelihood of the poor. Some scholars have proposed the concept of multidimensional poverty. He believes that human poverty includes not only income poverty, but also poverty in objective indicators such as drinking water, sanitation facilities, and housing conditions, as well as poverty that is subjective to the basic welfare of society. In the later period, the concept of "capacity poverty" was further proposed. The root cause of poverty was the lack of capacity. That is, poverty is the deprivation of basic viable capacity for employment, education, medical care, and health, not just low income. Therefore, the policy system of multi-level and multi-type education such as basic education, vocational education, higher education and adult education for poverty alleviation needs education as a whole, and it is indispensable for mutual planning, balanced and coordinated development.

4. Conclusions

This paper uses the multi-dimensional poverty measurement method and uses the SHES2011 rural household data to measure the multi-dimensional poverty situation of farmers in western China. Identifying and analyzing poverty from a multi-dimensional perspective can better explore the essence of poverty and provide a more accurate scientific basis for the government to formulate anti-poverty measures. In terms of dimensions, the poverty problem of the poor in education and health is more common than that of the non-poor. The deprivation in these two dimensions is the most important factor in the multi-dimensional poverty in rural areas of western China. In order to further implement the precise poverty alleviation strategy, it will help farmers to get rid of poverty and prevent them from returning to poverty through working in cities. The key is to build a multi-dimensional poverty measurement index system suitable for China's national conditions as soon as possible, and set uniform measurement indicators and thresholds from the national and government levels. Moreover, as the main source of labor force for urban development, the migrant workers in the western region should become the basic driving force and strategic resources for urban development. The incidence of multi-dimensional poverty based on income, education, health and living conditions is significantly higher than that of income poverty, which also shows that poverty measured by income standards underestimates the actual poverty level. Therefore, in view of the current situation of regional development, the characteristics of multi-dimensional poverty and the existing problems in anti-poverty, the future poverty alleviation work should adhere to the strategy of precise poverty alleviation and precise poverty alleviation. However, the implementation of the precise poverty alleviation strategy requires a more comprehensive and scientific identification of the poor and precise policy implementation from a multi-dimensional perspective.

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Shaanxi Provincial Science and Technology Department.
2016KRM054 Multidimensional performance evaluation and management system optimization of returning farmland to forest project in Shaanxi.
Science and technology planning project of Yangling demonstration area. 2015RKX-03 Evaluation and optimization of collaborative innovation of agricultural science and technology in Yangling.

References