



Research on the Restrictive Factors of Sustainable Livelihood of Farmers in Ethnic Minority Regions of Qinghai Province After Poverty Alleviation Under the Background of Big Data

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Abstract. Based on the background of big data and from the perspective of sustainable livelihood framework, this paper takes the minority regions represented by Qinghai Province as the research area, from five perspectives of natural, physical, human, financial and social capital, and based on a large number of interviews and surveys and objective data on the constraints on the sustainable livelihood of farmers in minority areas after poverty alleviation. Due to poor natural conditions, late start of development and unequal distribution of social resources in ethnic minority areas, farmers and herdsmen who have been lifted out of poverty are at a high risk of returning to poverty, and it is difficult to ensure the sustainable livelihood of farmers. In the context of big data, the analysis of the constraints on the sustainable livelihood of farmers in ethnic minority areas after poverty alleviation is of great significance to the research on how to guarantee the sustainable livelihood level of farmers and prevent the poverty-stricken agriculture and animal husbandry from returning to poverty.

Keywords: Big Data Background · minority regions · sustainable livelihood · Qinghai province · restricting factors

1 Introduction

On February 25, 2021, General Secretary Xi Jinping solemnly declared to the world that, with the concerted efforts of the whole Party and the people of all ethnic groups in China, China had won a comprehensive victory in the tough battle against poverty. All 98.99 million rural people living under the current poverty line were lifted out of poverty, and all 832 poverty-stricken counties were lifted out of poverty. All 128,000 poor villages were listed, and poverty in all regions was resolved. The arduous task of eradicating absolute poverty was accomplished, demonstrating to the world the effectiveness of poverty alleviation under the socialist system with Chinese characteristics.

At the same time, we should also be soberly aware that the realization of rural absolute poverty alleviation does not mean the permanent disappearance of poverty. Consolidating

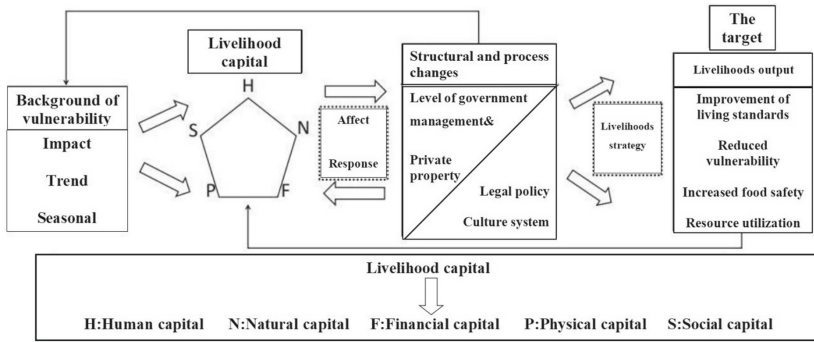


Fig. 1. Sustainable Livelihoods Framework mind map

the achievements of poverty alleviation, preventing households from returning to poverty, and ensuring farmers’ ability to sustain their livelihoods are the key, provided that the constraints are identified [1]. General Secretary Xi Jinping stressed: Changing big data, we should pay, meticulous planning, layout in advance, strive to actively, understand the present situation and trend of development of the large data and the impact on the economic and social development, analyzes the big data development achievements and existing problems, and promote the implementation of the national strategy of big data, to speed up the perfect digital infrastructure, promoting open data integration and sharing, We will ensure data security, accelerate the construction of a digital China, and better serve China’s economic and social development and the improvement of people’s lives [2]. Big data technology has five basic features, referred to as 5V features, namely, large Volume, Variety, Velocity, Value and Veracity [3]. It is of great significance to study the constraints on the sustainable livelihood of farmers and herdsmen in ethnic minority areas of Qinghai Province after poverty alleviation.

Based on the background of big data, this paper will explore it from the perspective of sustainable livelihood framework. At present, a more mature sustainable livelihood theory is the sustainable analysis framework proposed by the Department for International Development (DFID) in 1999 [4], as shown in Fig. 1.

Qinghai ethnic regions is the second largest tibetan-inhabited area in China, and it is also an important dwelling place for the Hui, Mongolian, Salar and other ethnic minorities. According to the seventh National Population census bulletin of Qinghai Province, among the permanent resident population of Qinghai province, the Han population is 2993534, accounting for 50.53%; the population of ethnic minorities was 2,930,423, accounting for 49.47%. Due to the historical vicissitudes of the Tibet-related regions in Qinghai, the ecological fragility, the frequent occurrence of natural disasters, the low level of education and culture, the low ability of self-development, the particularity of ethnic composition, traditional culture and geographical environment, the poverty in this region is relatively serious, deep and extensive, and the anti-poverty work is arduous.

2 Geographical Factors: Fragile Ecosystem, Harsh Environment, Frequent Disasters

Three-River-Source National Park is one of the areas with the highest concentration of high-altitude biodiversity in the world, and also one of the regions with the most abundant water resources in the world. Therefore, it is known as the “Water tower of China”. It is the largest nature reserve in China and the highest natural wetland in China, with an average altitude of more than 4,000 m. Three-River-Source is known as the “Water tower of China”, accounting for 25% of the total water of the Yangtze River, 49% of the Yellow River and 15% of the Lancang River. There are seven national nature reserves covering 207,400 square kilometers, 5,381,000 ha of forests and 8,143,600 ha of wetlands. It is one of the world’s most biodiverse high-altitude nature reserves and one of the most sensitive to the ecosystem. In recent years, through the implementation of a series of environmental protection policies such as returning farmland to forest, returning grazing land to grassland and ecological protection compensation policies, the ecological environment of Qinghai Province has been significantly improved, but according to big data, the trend of ecological environment deterioration has not been completely contained. The key ecological fragile region of desert oasis in Qaidam Plateau basin belongs to the alternate ecological fragile region of desert oasis in northwest China. The grassland is overgrazed, indiscriminate mining and excavation, the vegetation is seriously degraded, the water and soil conservation and water conservation ability are reduced, and the trend of desertification expansion is obvious. Qinghai province has more than 40 million hectares of natural grassland, grassland rodents are very harmful, not only damage the growth of plants, but also damage the stability of grassland ecosystem. In addition, the previous rodent prevention measures are not perfect, so that the flood of rodents, a large area of natural grassland in Qinghai province formed a great threat. Due to the frequent occurrence of rodents, the degree of grassland desertification and black soil flatland is still increasing.

There are still some deficiencies in the ecological compensation mechanism of the Three-River-Source. First, the subject and object of ecological compensation in the Three-River-Source region are not clearly defined, and the implementation of ecological compensation faces many challenges. Second, China’s ecological compensation standard system is still incomplete, the ecological compensation standard is relatively low, can not effectively encourage public participation. In addition, China’s research on the relevant mechanism of ecological compensation guarantee is lagging behind, and ecological compensation cannot guarantee long-term operation. Finally, the ecological compensation fund mainly depends on the central financial transfer payment, and lacks the participation of market entities. There are few ways to raise the ecological compensation fund, and local financial support faces the problem of capital competition [5].

Ethnic minority regions in Qinghai Province also have the highest incidence of natural disasters in China. Common natural disasters include earthquake, drought, snow disaster, frost disaster and waterlogging, which greatly restrict the production and life of local farmers. The Yushu earthquake was one of the worst to hit China in recent years. At 7:49 am on April 14, 2010, a 7.1-magnitude earthquake hit Yushu, Qinghai Province, killing 2,698 people and causing severe economic losses. According to the Analysis of

China Earthquake Networks Center, Yushu has experienced many earthquakes in the history from the perspective of geological structure. Yushu is located in the central part of the Qinghai-Tibet Plateau block. The geological activity of this plate is relatively strong. Earthquakes of moderate strength and above have been continuous in history, so the Yushu earthquake is not an accidental phenomenon. Big Data surface, Yushu and Guoluo of Qinghai province belong to the Bayan Khala block in terms of geological structure, and this block is relatively active in earthquakes. The magnitude 7.4 earthquake in Maduo County on May 22, 2021 also proved this point again. Snow disaster is also a common natural disaster in ethnic areas of Qinghai Province. In December 2018, heavy snowfall continued for several days in many parts of Qinghai Province. In Yushu, Guoluo and Haidong three prefectures (cities), a total of 53,000 households and 210,100 people were affected by the storm. 2,862 families, 9,652 people and 223,300 head of livestock were relocated. For a time, 1,973,300 head of livestock struggled to find food, and 57,900 head of livestock died due to the disaster, resulting in a direct economic loss of 192 million yuan.

Based on big data, it can be seen that the lack of natural capital and environmental vulnerability in ethnic minority regions of Qinghai Province seriously restrict the sustainable livelihood of local farmers after poverty alleviation, and the sustainable livelihood level is insufficient.

3 Physical Capital is Weak, Urbanization Level is Low, Industrial Development is Limited

The economic and agricultural development level of Qinghai Province has lagged behind the national average level for a long time. According to the 2020 Statistical Communique of Qinghai Province on National Economic and Social Development, the annual GDP of Qinghai Province reached 300,592 billion yuan. As can be seen from Table 1, the economic level of the eight ethnic minority provinces is still relatively low in the whole country, and the total GDP of the eight provinces only accounts for about one-tenth of the national GDP. Among them, Qinghai province's GDP, per capita GDP, rural residents' disposable income and the added value of the primary industry are still in a relatively backward position among the eight ethnic provinces. The six prefectures in Qinghai province alone cover an area of 696,263 square kilometers, while the cities are only three county-level cities – Yushu, Geermu and Delingha – and 23 counties. The total urban population is only 1.068 million, and the average urbanization rate is about 42%.

Through big data, Qinghai province is large and sparsely populated, the land utilization rate is low, and the urban layout is scattered, which makes it difficult to play the agglomeration effect that cities and towns should have. Most small towns are built on a small scale, and it is difficult to attract the migrants to settle down in Qinghai province due to various reasons such as bad climate, weak economic foundation and relatively backward public infrastructure construction [6].

From this perspective, the constraints on the sustainable livelihood of poverty-stricken households in ethnic minority regions of Qinghai Province after poverty alleviation are, firstly, the low level of economic and industrial development. Big data shows that, the village and herding area in Qinghai economic industry overall development is

Table 1. Comparison of main economic data between eight ethnic minority provinces and the whole country in 2020

Region	Index			
	2020 GDP (100 million yuan)	Per capita GDP in 2020 (100 million Yuan)	Rural residents in 2020 Disposable Income (yuan)	The added value of the primary industry in 2020(100 million Yuan)
Nationwide	1015986	72371	17131	77754
Inner Mongolia	17360	68357	16567	2025
Xinjiang	13798	54684	14056	1981
Tibet	1903	54285	14598	151
Guangxi	22157	44671	14815	3556
Ningxia	3921	56445	13889	338
Yunnan	24522	50474	12842	3599
Guizhou	17827	49206	11642	2540
Qinghai	3006	49455	12342	334
Eight ethnic minority provinces and regions	104494	53447	13843	14524

(Note: The data in the table are from the 2020 National Economic and Social Development Statistical Bulletin of the National Bureau of Statistics and eight ethnic minority provinces and Autonomous regions)

slow, are always faced with many factors, such as enterprise scale is small, the lack of market competitiveness, some products although scale economic efficiency is higher, but the size of its economy size is not big, most of the enterprise did not form enough economic scale, both the degree of specialization collaboration and production concentration degree is not high. Many industrial enterprises are closed production, low production level, lack of cooperation and division of labor ability, low efficiency, poor technical benefits, market share is not high, the scale of the industry is naturally not satisfactory, it is difficult to obtain advantages in external competition, it is difficult to open up a broad market.

Second, lack of funds, no stable supply of capital chain. Enterprises do not have a high accumulation rate, lack of funds, and bank credit is the main source of their working capital. Under such a capital supply environment, enterprises are in a state of operation stress for a long time. No matter it is difficult to research and develop, update products or upgrade technology, the production process has been trapped in a vicious circle. For the village and herding area in qinghai province, the most characteristic industry belong to the resources development, both to the experience of science and technology demand is higher, and to put in the amount of money is not low, many industry with the nature of

the risk investment, general strength of state-owned enterprises and private companies do not have enough investment, it makes a lot of characteristic products development progress to a halt. In addition, the lack of advanced ideas and scientific management ability of relevant decision makers, the lagging construction of infrastructure, poor soft environment for investment and other factors, also formed a lot of obstacles to attract investment, in the aspect of capital raising enterprises are faced with greater difficulty [7].

In the process of research, the author also found that it is difficult to choose poverty alleviation projects. As in Gande county investigation understands, Gande county in the Tibetan plateau, belongs to the less developed regions, low starting point, the animal husbandry economy structure is single, and because most of the herdsmen still engaged in traditional animal husbandry, cultivating narrow channel characteristic industry, industry selection, breeding for poverty alleviation, cycle is long, poverty alleviation and homogeneity problem is more outstanding. At the same time, the county's industrial enterprises and professional cooperatives are small in scale and weak in the ability to bring poverty, so it is still difficult to form a stable risk-sharing and benefit-sharing mechanism with the poor households. During the investigation in Huangyuan County, found that the existence of a single industrial development model, narrow channels. Due to regional conditions and county development, as it is located in the county seat and restricted by urban planning, the development of planting and breeding industry is limited and limited to asset income. Second, the awareness of industrial development is not strong, insufficient capacity. The main causes of poverty in poor households are illness, disability, lack of labor force, single skill, lack of ability to develop industry, and lack of awareness of industrial development. In addition, due to the influence of traditional concepts and other factors, the cultural level of some farmers is limited and the skills are single, which makes the industrial development difficult. Third, the production cost of Qinghai is high, but the content of science and technology is not high. From the perspective of the market, on the one hand, the quality of goods is required to be good. On the other hand, the production technology content of products has a profound impact on market development. Innovative inventions and unique processes are often important to the long-term development of the industry, and the products it produces have a promising market [8], but in Qinghai's farming and pastoral regions, there are only a handful of companies that can manufacture high-tech products. Due to the lack of scientific and technological talents, the proportion of high-tech industry is not high, and most of the products are primary products with low grade, low technical content, small added value, and the ability of deep processing and research and development of enterprises are not strong. The infrastructure construction is not in place, the information exchange is not smooth, big data shows that the characteristic products of Qinghai Province can not go out of the Qinghai-Tibet Plateau for a long time.

In addition, the urban layout planning is unreasonable. Since the implementation of the national economic policies since the reform and opening up, with the acceleration of the process of national industrialization, the urban system in agricultural and pastoral regions has been basically formed, but the development of urban system in agricultural and pastoral regions is not very developed, and it does not meet the needs of regional national economic development. Average small population size of cities, urban system

development is inadequate, Qinghai pastoral regions of town, mostly after the founding of new China established administrative and mining industry development based on embedded town, deep and pastoral regions lack of organic connection and economic interaction, small size of cities and towns and large pastoral regions, difficult to driving the development of pastoral regions hinterland, town island effect, It is very difficult to promote urban-rural integration. There are no large cities in the pastoral regions of Qinghai, only yushu, Geermu and Delingha are small and medium-sized cities, and most of them are small towns. Three small and medium-sized cities and 23 counties constitute the main part of the towns in the pastoral regions of Qinghai province. In addition, the pastoral regions are vast, the distances between towns are too far, the distribution of towns is not balanced, and the structure of towns is not reasonable. It is difficult for towns to form a good interactive urban system. For example, Golmu city and Delingha city are more than 400 km apart from each other. Due to the economic convergence and distance between the two cities, their interaction ability is relatively weak [9].

4 The Supply of Social Capital is Still Insufficient and the Infrastructure Construction is Backward

The development environment of multi-ethnic regions in Qinghai Province is different from that of plain areas. Most of the farming and pastoral areas are located in remote areas and are basically plateau areas, and the locations of villages and towns are quite scattered, which greatly increases the difficulty of providing a large number of social public resources. For a wide range of large-scale infrastructure construction and maintenance including water and electricity facilities, traffic road of manpower and material resources, funds have very high demand, construction cost and maintenance cost is relatively concentrated area is much higher, so a lot of social capital is scarce in the poor areas in Qinghai province, especially in remote parts of Tibet region, such as Yushu, Guoluo, Local infrastructure supply costs are extremely high, and it still takes time to achieve a balanced allocation of public resources and public goods.

Furthermore, infrastructure construction is still lagging behind. Big data shows that, although the multi-ethnic farming and pastoral regions have paved roads or hardened cement roads, the standards are low and the roads are in poor condition. Water conservancy infrastructure construction is weak, power grid in Yushu, Guoluo remote regions have no full coverage, communication, etc. Such as group in gander county investigation found that although according to the funding exit, poverty-stricken counties to pick a hat indexes can amount to mark, but the quality of the county out of poverty is high enough, especially in the water, electricity, roads and other infrastructure and public service facilities still exist, especially the problem in the pastoral region, such as hardening of the road to the village committee, but between the club and the club, door and door is not fully hardened road, Such as electricity, for some scattered remote pastoral families, can only use photovoltaic power supply.

5 Low Level of Human Capital, Backward Concept of Financial Management, Lack of Social Capital

The low level of human capital is a major constraint to the sustainable livelihood of poverty-stricken households in ethnic regions.

As shown in Table 2, the national eight provinces and regions in 2020 medical institutions, general this specialized subject students, financial institutions RMB loan balance and so on, respectively, on health, education, finance three related indicators of human capital, the obvious gap compared with the national average, which are still backward status in the national eight provinces and autonomous regions of Qinghai province.

Poverty and return to poverty due to disease are common risks that limit sustainable livelihoods of farmers and herdsmen. The medical resources in Qinghai province are relatively backward compared with other provinces. First, the number of medical and health institutions is small and the medical level of institutions is not high. Second, Qinghai Province, especially multi-ethnic farming and pastoral regions, is short of medical personnel. The poor natural conditions make the incidence of diseases of farmers and herdsmen higher, and the backward medical and health conditions make it more difficult to guarantee the health of farmers and herdsmen and maintain their sustainable livelihood.

In addition, Qinghai province lacks educational resources, with only 12 colleges and universities in the province. The limited educational resources also lead to the lack of

Table 2. Statistical table of human capital indicators in eight ethnic provinces and regions

Region	Index		
	Health care Number of Organizations in 2020 (Units)	undergraduate studying at all sorts of universities and colleges in 2020 (ten thousand)	Balance of various RMB loans of financial institutions in 2020 (100 million Yuan)
Qinghai	6435	9	6578.23
Ningxia	4574	15.61	7782.59
Yunnan	26627	128.38	34717.96
Guizhou	28900	84.02	32235.75
Inner Mongolia	24614	48.7	23249.2
Guangxi	33875	118.4	34738.99
Xinjiang	15631	48.67	22377.6
Tibet	1661	3.86	4956.89
Eight ethnic minority provinces and regions	142317	456.64	166637.21
Nationwide	1023000	3285.3	1727000

agricultural talents in the farming and pastoral regions of Qinghai Province, and the endogenous motivation of farmers and herdsmen is still insufficient.

The shortage of professional talents is an important factor restricting the slow development of ethnic regions. The lack of talents is a prominent and difficult problem to solve in the sustainable livelihood of the poverty-stricken households in the multi-ethnic regions of Qinghai Province. It is very difficult to introduce and retain talents in the multi-ethnic farming and pastoral regions of Qinghai Province given the current conditions and the treatment they can provide, let alone the less developed townships in the province. The pastoral regions more remote, transportation and living conditions are very backward, and there are many places is the implementation of accurate poverty alleviation policy after implementation power, path and so on, a lot of families are self-sufficient, can want to see the living environment of backward, this development lag behind, lack of pastoral regions with poor living conditions to attract talents, It is quite common for college students working at the grass-roots level to take the work in farming and pastoral regions as a springboard for grassroots work experience [10]. When the conditions are met, they want to develop in counties or even provinces or cities. But many poor families spend a lot of energy to cultivate their children to study, even back heavy debt also want their children to go out, and the children go out through the study seldom come back to work after graduation, more choice to stay in high wages, living conditions good big cities work, even if part of the back home also can choose in the state or county, It's rare to get back to work. Multi-ethnic undeveloped pastoral regions of Qinghai province more than not retain talent, in contrast to a better place by conveying the talent, so now the absence of pastoral regions working talent is more and more serious, research work in rural regions, agricultural technology talents is more and more far away from farmers and herdsmen, this give modern farming and animal husbandry development, stable development goals to reduce poverty increased very high difficulty.

In a bank in Guoluo, the author found that a small number of farmers and herdsmen lack the correct concept of financial management, do not pay attention to financial management, not good at financial management, even if they have more income, life will always fall into the constraints, difficult life, resulting in poverty, and because their children go to university, the population is large and other reasons. In addition, the credit environment is worrying, the credit awareness of farmers and herdsmen is weak, and affected by the non-performing loans of the previous year, there is the idea of default. To fundamentally change their thinking is really very difficult, and the time is relatively long. The punishment for breach of trust is insufficient. Although financial institutions take the initiative to collect non-performing loans in various ways, they have little effect. They only rely on risk prevention and control funds to extend loans in multiple times, and there are risks in the absence of other guarantees and weak credit awareness of farmers and herdsmen.

6 Conclusion

Under the background of big data, based on the sustainable livelihood framework, the minority regions represented by Qinghai Province are the research areas, based on a large number of visiting survey and objective data to farmers out of poverty in the ethnic areas

after the restriction factor of sustainable livelihoods study, from the natural, material, manpower, financial and social capital five Angle analysis, the main conclusions are as follows.

6.1 The Sustainable Livelihood Ability of Ethnic Minority Areas is Restricted by the Five Dimensions of H, N, F, P and S

The development of ethnic areas has a relative lag, the key gap of the development of Qinghai ethnic areas, the first is the natural capital Angle of ecological fragility, bad environment, frequent disasters, weak material capital; second, from the perspective of material capital, the economy is backward, the level of urbanization is low, and the industrial development is difficult; third, from the perspective of human capital, the lack of human capital due to the low level of science and technology, education, culture and health; fourth, from the perspective of social capital, the supply of social and public capital is insufficient, the infrastructure construction is backward, and the social organization structure is not perfect; fifth, from the perspective of finance, the financial undertakings in minority areas are underdeveloped and the farmers' financial management concepts are backward.

6.2 To Improve the Sustainable Livelihood Level of Farmers in Ethnic Minority Regions and Prevent Poverty-Stricken Households from Returning to Poverty, a Support System Should Be Established from Five Dimensions

To ensure the achievement of poverty alleviation, ensure the sustainable livelihood level of farmers, and prevent the return to poverty, the government and society should make efforts from the above five dimensions, formulate reasonable and effective policies according to local conditions, and establish a support system to guarantee the sustainable livelihood of farmers.

6.3 Big Data Should Be Used to Build and Improve the Database of Poverty Alleviation Households in Qinghai Province

Big data can more clearly reflect the number of people lifted out of poverty, assistance measures and sustainable livelihood capacity in various regions of Qinghai Province. At present, although there is a database, the data is not comprehensive enough, the update cycle is long, and the data reflect the distortion, which needs to be further improved and updated. Under the background of big data, the application of database can directly show the economic situation of the poverty-stricken households, making the recognition system of returning to poverty more scientific and efficient. Big data can be used to comprehensively analyze and estimate the development prospects of the region, provide scientific guidance for the policy formulation of governments at all levels in Qinghai Province, better supervise the implementation of assistance policies and the use of assistance resources, and ensure the sustainable livelihood of farmers.

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