Research on the Models of Precision Poverty Alleviation: A Case Study in China Power Industry

Li Ma[1], Rui Li [1a*]

[1] *State Grid Energy Research Institute Co., Ltd Changping district Beijing, China*
[a*] *reallee@126.com*

ABSTRACT
Based on the advantages and characteristics of the power industry, targeted poverty alleviation works of power companies are very important for China to win the battle against poverty, and, in the meanwhile, it also can effectively connect poverty alleviation and rural revitalization. In this article, the important roles of the poverty alleviation works of Chinese power companies are first analyzed. And then, the main models and experiences of Chinese power companies for poverty alleviation are summarized in detail. On this basis, the strategies and suggestions are put forward, in order to provide some references for the next step.

Keywords- *Targeted poverty alleviation; poverty alleviation model; rural revitalization*

1. INTRODUCTION

The power grid is one of the most important infrastructures in every country, and it is also the material basis for the realization of basic public services for power supply. Carrying out power poverty alleviation work, continuously strengthening the construction of power facilities in impoverished areas, effectively improving the universal service level of electric power, and carrying out the innovation of the power industry's poverty alleviation model are key measures to improve the production and living conditions of my country's impoverished areas, and it is also an important way to achieve the targeted poverty alleviation of the poor. It is very important for our country to win the battle against poverty and realize the revitalization of the countryside.

When the People's Republic of China was founded, the total annual electricity consumption in rural my country was 20 million kilowatt-hours, accounting for only 0.58% of the total electricity consumption in the whole society. In order to completely solve the electricity problem of people without electricity in poverty-stricken areas, my country's electric power industry has continued to make efforts to basically solve the electricity problem of people without electricity by the end of 2015, and my country's electricity universal service level has been significantly improved. Especially since the start of the targeted poverty alleviation work, the power industry has focused on solving the weak links of the power grid in deeply impoverished areas. Taking the State Grid Corporation of China as an example, it has continuously increased its investment in power grids in poverty-stricken areas, effectively solving the electricity problem of 1.92 million households with 7.5 million people without electricity, and realizing electricity in all villages except Tibet. Through joint efforts, my country's per capita electricity consumption reached 4,956 kWh in 2018, which is close to the world average.

At the beginning of reform and opening up, the low level of rural electrification in China and the weak rural power grid constrained my country's rural economic and social development. Since then, China has attached great importance to the construction and transformation of rural power grids, and successively implemented a number of power poverty alleviation projects. Since the start of the targeted poverty alleviation work, the implementation of a new round of rural power grid transformation projects has improved the power supply capacity and quality of rural power grids [1]. The effective improvement of the quality of power supply has improved the living conditions of farmers, met the power demand for the development of "electric roasted tea" and other special poverty alleviation industries according to local conditions, and also broadened the road to poverty alleviation [2]. Power poverty alleviation not only injects strong momentum into the development of the industry, but also increases jobs in poverty-stricken areas and boosts the confidence of the poor to become rich. After the implementation of the targeted poverty alleviation

strategy, the GDP growth of my country's primary industry has increased by 12 percentage points over the previous period.

China has a vast territory, with great regional differences between the east and the west, and the gap in the level of economic and social development between urban and rural areas is obvious. In order to do a good job in poverty alleviation cooperation and counterpart support between the east and the west, the power industry has made full use of the development advantages of groupization and the ability to coordinate and allocate resources within the industry to carry out paired assistance work in various ways between the east and west regions of China to effectively improve assistance benefit. Taking the State Grid Corporation of China as an example, it has strengthened funds, talents, and technical assistance between different regions in the east and west in a variety of ways, and continued to promote the poverty alleviation cooperation between the east and the west, and between urban and rural areas to a new level.

2. MAIN MODELS AND EXPERIENCES OF CHINA'S ELECTRIC POWER TARGETED POVERTY ALLEVIATION

2.1. Poverty alleviation ideas

The first one is to focus on the task of power grid construction and transformation in deeply impoverished areas. Affected by factors such as natural conditions and geographical location, the rural areas under the jurisdiction of the State Grid Corporation of China account for a high proportion of deeply impoverished counties and impoverished villages, and the development level of the power grid is far below the national average. There are still shortcomings and weaknesses in many aspects such as quality. The power grid is a key infrastructure for improving living conditions and development conditions in deeply impoverished areas, and it plays an important basic role in the fight against poverty. Focusing on the power grids in deeply impoverished areas, the primary task of the State Grid Corporation for power poverty alleviation work is to make great efforts to carry out the construction of urban and rural distribution networks and the transformation and upgrading of rural power grids in deeply impoverished areas. The economical and environmentally friendly power grid provides safe and reliable power guarantee for the poverty-stricken areas to win the battle against poverty.

The second one is to focus on solving the problem of unbalanced and insufficient power development. There are obvious gradual differences in the development of China's east, middle, and west, showing a trend of weakening from east to west. Due to the obvious advantages of the eastern region in many areas such as location conditions, science and technology, the above-mentioned regional development gap is still expanding. At the same time, there are also many development imbalances between urban and rural areas such as uneven investment in infrastructure construction, uneven allocation of public service resources, obvious differences in social investment, uneven demographic dividend tilt, and significant differences in residents' income. Affected by the overall environment, China's urban, rural, and regional power grids also suffer from unbalanced and inadequate development. The development level of power grids in the central and western regions lags behind that of the eastern regions, and rural power grids lag behind the urban power grids in many aspects such as power supply quality and transfer capacity. This has created a huge obstacle to the further development of agricultural production and industry. In addition, poor natural conditions in the western rural areas, high cost of infrastructure construction such as electricity and public service supply, and weak economic foundation make it more difficult to solve problems by local forces alone, resulting in a vicious circle in the development and construction of power grids in impoverished western areas. The poverty level in the western region is deep, the cost of poverty alleviation is high, and the difficulty of poverty alleviation is high, which is the shortcoming of poverty alleviation. Therefore, the State Grid Corporation of China focuses on solving the problems of unbalanced and insufficient power development, fully mobilizing the rational and optimal allocation of people, finances and materials between different regions and between urban and rural areas, and promotes the continuous assistance of advanced science and technology in the power industry, and promotes regional Coordinated development and continuous promotion of urban and rural development are an important part of power poverty alleviation.

The third one is to focus on the effective connection of power poverty alleviation and rural revitalization. At present, the rural poor population has decreased significantly, the production and living conditions in poor areas have been improved, and decisive progress has been made in the fight against poverty. However, it should be noted that the disappearance of rural poverty does not mean the end of poverty alleviation work. At present, the level of productivity in China's rural areas is still low, the level of industrial development is poor, and there is a lack of characteristic industries with pillar functions, especially the lack of industries that can bring sustainable and stable income to farmers, and there is a risk of poverty alleviation and return to poverty. How to achieve long-term poverty alleviation, prevent poverty return, promote the balanced development of urban and rural society and the full development of rural areas while winning the battle against poverty is the core issue that needs to be considered, and it is also the fundamental goal of China's rural revitalization strategy. It can be seen that winning the battle against poverty is the prerequisite and

foundation for rural revitalization, and implementing the strategy of rural revitalization is to consolidate and upgrade the battle against poverty. Therefore, in order to achieve an effective connection between power poverty alleviation and rural revitalization strategies, focus on promoting the rural energy consumption revolution, building an electricity-centric rural energy consumption system, and coordinating the relationship between industrial development and ecological civilization construction is the key content of power poverty alleviation [3-5].

2.2. Typical model of poverty alleviation

Identifying the poverty alleviation model, effectively taking advantage of the industry, promoting the precise implementation of poverty alleviation measures, and promoting the real transformation of poverty-stricken areas are major issues related to the final results and long-term results of poverty alleviation. Three main models have been formed in the practice of poverty alleviation in China's power industry, which also explored a road to poverty alleviation with Chinese characteristics. The first is targeted poverty alleviation by power infrastructure, the second is poverty alleviation by power + industry + ecological integration, and the third is east-west poverty alleviation that promotes regional coordination.

(1) The targeted poverty alleviation model for power infrastructure. Contiguous poverty-stricken areas should focus on solving problems such as improving public services, building infrastructure, and developing industries. Insist on targeted poverty alleviation and electric power first, and in accordance with the "five key projects", tailor measures to local conditions and implement precise policies.

The first one is to develop production and alleviate poverty. The focus of power poverty alleviation is to improve the conditions of production and living in poverty-stricken areas, accelerate the construction of power grids in deeply impoverished areas, and improve the power supply capacity, grid structure and equipment level of rural power grids [6].

The second one is the construction of supporting power grids for relocation. According to the relocation plan for poverty alleviation and relocation, the State Grid Corporation of China plans to advance the construction of supporting power grids and prioritize funding to ensure that the supporting power grids are completed simultaneously with the relocation project for poverty alleviation.

The third is ecological compensation to alleviate poverty, to achieve green electricity supply and energy consumption in rural areas. Green energy supply can be realized by the development of photovoltaic, wind power, small hydropower and other clean energy power generation. At the same time, green consumption will be realized by promoting "replacement of firewood with electricity" and "replacement of coal with electricity". Therefore, while meeting the electricity demand for production and living, it can also protect the ecological environment.

The fourth one is to develop education and get rid of poverty. The State Grid Corporation of China strives to improve local educational infrastructure conditions by providing funds, talents, and industrial development opportunities.

The fifth is to improve the general service level of electricity. State Grid and other power companies implement electricity fee reductions and exemptions for specific poor people in accordance with relevant policies.

(2) The second is the poverty alleviation model of power + industry + ecological integration. By developing rural energy resources and supporting the development of green industries in rural areas, the State Grid Corporation of China has formed a typical model combining green industry development and ecological protection.

The first mode is to achieve poverty alleviation through photovoltaic and other new energy power generations. Through the development and utilization of new energy resources such as photovoltaics, Chinese power companies have promoted the economic development of impoverished areas and accelerated the adjustment of rural energy structure. For regions that have the conditions to develop photovoltaic power generations, Chinese power companies cultivate stable industries by building photovoltaic power stations, which brings benefits to the poor. In other resource-rich regions, Chinese power companies have developed new energy sources such as small hydropower and biomass power generations to meet local production and domestic electricity consumption [7-8].

The second model is the characteristic industry + power electricity model. According to local resource endowments, Chinese power companies implement special industries such as tea, tobacco, and organic food, and implement electricity substitution projects such as "coal to electricity" for tea and flue-cured tobacco processing, which can not only improve production efficiency, but also improve product quality and increase market competitiveness.

The third mode is green power + clean heating + ecological protection mode. In order to protect the ecological environment and improve the quality of energy use, Chinese power companies such as the State Grid Corporation of China implemented "coal-to-electricity" clean heating, which improved the electrification level of herders' households and achieved a win-win situation for poverty alleviation and environmental protection.

The fourth mode is the special poverty alleviation mode of electricity trading. Chinese electric power companies have promoted the priority participation in power market transactions in deeply impoverished areas, and have given full play to the advantages of large power grid resource allocation, effectively reducing electricity costs for poverty alleviation projects.

(3) The East-West poverty alleviation model that promotes regional coordination. Chinese electric power companies uniformly deploy the group's internal resources, formulate precise support policies, and carry out east-west assistance in multiple ways.

In terms of funding, in response to the lagging development of power grids in impoverished areas in the west and weak construction investment capabilities, power companies have arranged for eastern companies to invest in assistance funds to specifically support the development of power grids in the western regions and enhance the development capabilities of power grids in impoverished areas.

In terms of materials, power companies have established a sound and long-term mechanism for material allocation, and prioritized inventory materials to meet the needs of western power grid companies.

In terms of talents, electric power companies carry out exchanges of outstanding talents between the eastern and western regions, and at the same time organize outstanding talents from the east to help carry out work in impoverished areas, and select young talents from western provinces to study and exercise in the eastern region.

3. RELEVANT SUGGESTIONS FOR POWER COMPANIES TO CARRY OUT POVERTY ALLEVIATION

First, a long-term mechanism for universal power service needs to be established. In accordance with the principles of openness, fairness and justice, it is necessary to establish a universal power service fund to provide long-term financial support for the construction of power grids in rural and remote areas to ensure that the poor can pay for electricity.

Second, it is necessary to further increase the central government's support for poor areas to fill the funding gap for power grid construction. The foundation of rural power grids is weak, and the investment in construction and transformation is large. It is recommended that the central government increase the proportion of central capital for rural power grid projects in accordance with the status quo of the power grid to help solve the problems, including rural power grid construction and high operating costs in poor and backward areas.

Third, it is necessary to achieve an effective connection between poverty alleviation and rural revitalization strategies. It is necessary to further analyze the situation and tasks faced by the poverty alleviation and rural revitalization strategy, and conduct research on the measures of rural electrification. In particular, the current rural planning, industrial planning, and public service planning should be considered as a whole, and the power infrastructure construction should be arranged scientifically.

4. CONCLUSION

Electricity, as the most important material basis for supporting the development of the national economy, plays an extremely important role in China's fight against poverty and the integration of rural revitalization strategies. Electric power companies have always strived to enhance their sense of responsibility and mission for precision poverty alleviation and rural revitalization, make full use of their own industry characteristics and advantages in technology and capital, take multiple measures, and strive to explore and innovate power precision poverty alleviation models, and develop an industry-specific model. The road of targeted poverty alleviation and development has positive reference significance and reference value for other enterprises to actively carry out targeted poverty alleviation and rural revitalization.

REFERENCES

[1] Jing Li. (2017) Advantages, difficulties and strategies of poverty alleviation in rural tourism under the background of targeted poverty Alleviation. Reformation & Strategy, 290: 126–128.

[2] Wirawan Hanni. (2021) The effects of renewable rnergy-based village grid electrification on poverty reduction in remote areas: The case of indonesia. Energy for Sustainable Development, 62: 186-194.

[3] Wei Qiushuang. (2009) Sustainability evaluation of photovoltaic poverty alleviation projects using an integrated MCDM method: A case study in Guangxi, China. Journal of Cleaner Production, 302: 127040.

[4] Huang Guo Qing; Tsai Fu Sheng. (2021) Social Innovation for food security and tourism poverty alleviation: some examples from China. Frontiers in Psychology, 12: 614469-614469.

[5] Ma Zhentao. (2020) Research on sustainable evaluation of poverty alleviation governance at county level in China based on survey data of 86 counties. Chinese Studies 09: 83-95.

[6] Khan SalahUdDin. (2020) Environmental sustainability: a clean energy aspect versus poverty. Environmental Science and Pollution Research 28: 13097-13131.

[7] Wei Yangjing. (2020) Report on the targeted poverty alleviation in southwest China: The study of Longtou village, Dazhou, Sichuan province. Open Journal of Social Sciences 08: 19-38.

[8] Huiming Zhang; Zhidong Xu; Kai Wu; Dequn Zhou; Guo Wei. (2019) Multi-dimensional poverty measurement for photovoltaic poverty alleviation areas: Evidence from pilot counties in China. Journal of Cleaner Production 241: 118382.