ISSN: 2688-9323

Performance Evaluation and Reference of Photovoltaic Poverty Alleviation in Jinzhai County from the Perspective of Industrial Poverty Alleviation

Jingwei Fang

School of Economics, Anhui University of Finance and Economics, Bengbu 233030, China

Abstract

Industrial poverty alleviation is a kind of targeted poverty alleviation, and photovoltaic poverty alleviation is one of them. Jinzhai County is one of the poor counties that achieved economic development through photovoltaic industry earlier, which has reference significance for other poor areas in China. Therefore, this paper selects the development data of Jinzhai County from 2011 to 2017, and uses indicators such as rural employees, total power of rural machinery and total financial expenditure to analyze the poverty alleviation effect of Jinzhai County. It is found that after the implementation of photovoltaic poverty alleviation, the regional economy grows rapidly, the number of returned employment rises, the employment rate continues to improve, and the poverty alleviation effect is good;Among them, finance is essential to promote the PV poverty alleviation. This thesis investigated the main body of photovoltaic poverty alleviation business in Jinzhai County, and concludes the experience to serve case for other poor areas.

Keywords

Industrial Poverty Alleviation; Photovoltaic Poverty Alleviation; Jinzhai County; Principal Component Analysis; Business Entities of Industrial Poverty Amelioration.

1. Background

1.1. Industrial Poverty Alleviation

Industrial poverty alleviation combines the local stuff, environmental strength and industrial foundation in poor areas, relies on the beneficial natural and cultural situation, takes the growth of factory as the main direction, relies on enterprise technical funds, leans on cooperative organizations' favor, and takes the policy as the guarantee[1] At present, there are various types of industrial poverty amelioration in China, including: poverty amelioration by characteristic tourism, poverty amelioration by cash crop planting industry, poverty amelioration by photovoltaic, poverty amelioration by rural small hydropower and other projects.Industrial poverty amelioration is a significant approach to realize targeted poverty amelioration that transforms the past poverty amelioration of blindly importing funds into poverty amelioration of creating wealth, and drives the region out of poverty with regional advantages.

This power generation composes the "ten targeted poverty alleviation projects", which uses solar panels built on roofs and planting greenhouses to collect light energy for power generation.The power not only handles the difficulty of regional resource consumption, but supplies power to the State Grid to obtain income.In 2015, the pilot project of photovoltaic targeted poverty alleviation was over 1800 MW nationwide, with an devotion come back rate of over 13% and an equally yearly salary of over 2 billion yuan;The income of nearly 450000 poverty-stricken households who have set up archives and registered cards has increased, of which nearly 90000 are disabled poverty-stricken households, solving the plight of over 900 poverty-stricken villages without collective income.

ISSN: 2688-9323

1.2. Overview of the Project in Jinzhai

Jinzhai sits in the mountainous area, affected by the geographical location, inconvenient transportation, frequent natural disasters, leading to poor industrial and agricultural development.Jinzhai County, with its abundant solar and thermal resources,finance and science sources, has become the first area to accomplish the photovoltaic poverty alleviation.

As one of the earliest pilot counties of photovoltaic poverty alleviation in China, Jinzhai County, through four years of continuous exploration and reform, has gradually realized the project construction of door-to-door and village to village station construction, and initially formed four modes of "household by household, joint household, village collective, large-scale joint household".On this basis, the photovoltaic poverty alleviation operation and maintenance center has been gradually completed to maintain the normal operation of photovoltaic poverty alleviation power station through big data analysis.By 2020, Jinzhai has completed the assets confirmation work of 5856 photovoltaic power stations for poor households, 253 village level PV power stations and 47 centralized PV power stations to handle poverty, and has established a long and sustainable mechanism.

2. Literature Review

2015, the Fifth Plenary Session of the 18th CPC Central Committee came up with that by 2020, all poverty-stricken counties will be improved, and the people under the current standard will also be transformed out of poverty.To this end, domestic scholars Hu Zhenguang et al. (2016) said that the fundamental approach to handle the trouble of poverty is precise industrial poverty alleviation[2] That has benefited too much to cope with the poverty. At the end of poverty alleviation in 2019, Yang long et al. (2019) proposed that industrial poverty alleviation in poor areas has generated the inner vigor, which is helpful to get rid of the poverty gradually and stably.[3] Based on the essence of industrial poverty alleviation, Li Donghui and other scholars (2019) pointed out that industrial poverty alleviation has the characteristics of adaptability, diversity and flexibility to meet the development needs of poor areas.[4] According to the association between different parts during industrial poverty alleviation, Niu Shengqiang (2019) pointed out that industrial development not only provides basic support for continuous poverty alleviation and income increase, but also motivates the accomplishment of the reform in agriculture supply and the release of city expenditure dividends in village[5] In addition, on how to solve the association between the department and the corporation during the project, Chen(2019) proposed that the core purpose of the project is to foster the endogenous resource of poor people and balance the benefit among different parts.[6] Zhuo Fuyan (2020) proposed that during the whole procedures, we ought to tap the marketing potential of temporary cadres and strengthen the market connection of industrial poverty alleviation[7] It can be seen that establishing industries is an effective action to tackle poverty, and it is a sustainable way to prompt regional poverty amelioration through the growth of factories.

The poverty alleviation of PV industry in Jinzhai is the representative case in China.Through that, the economy of Jinzhai grows year by year, which has important reference value for the implementation of dealing with poverty in other spots in China.Therefore, this thesis appraises the policies and actions, used to solve the poverty, of Jinzhai before and after the establishment of PV industry in 2015 by principal component analysis, and investigates the specific influencing items, to accumulate experience.

ISSN: 2688-9323

3. Effectiveness Evaluation of Poverty Alleviation in Jinzhai County

3.1. Index Selection

According to the items influencing the achievement of poverty amelioration and the indicators provided by the official website of the statistical department, this paper selects the following indicators for principal component analysis.

Rural employees (10000): rural employees not only reflect the employment situation in rural areas, but also reflect the loss of labor force.

Machine total power of rural machinery: it reflects the industrialization process of agriculture and is a typical representation of village agricultural transformation.

GDP gross domestic product (ten thousand yuan): it manifests the growth of regional economy and productivity.

First industry added value (ten thousand yuan): it reflects the advancement of agriculture.

Total financial expenditure of Finance (10000 yuan): it reflects the influence of local department in coping with poverty.

Total food output (tons): reflects the situation of regional grain planting.

3.2. Data Selection

To ensure the statistics to be integral, authentic and reliable, this thesis selects the relatively complete data of Jinzhai County in Anhui Province from 2011 to 2017 from the China Poverty Alleviation database on the official website of EPS.

3.3. Principal Component Analysis

Principal component analysis is utilized to estimate the achievement of poverty amelioration in Jinzhai County from 2011 to 2017.

```
. pca work machine gdp first finance food

Principal components/correlation                  Number of obs    =          7
                                                  Number of comp.  =          6
                                                  Trace            =          6
    Rotation: (unrotated = principal)             Rho              =     1.0000
```

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	4.90565	4.03912	0.8176	0.8176
Comp2	.866526	.701444	0.1444	0.9620
Comp3	.165081	.112073	0.0275	0.9895
Comp4	.0530089	.0444508	0.0088	0.9984
Comp5	.00855804	.00738136	0.0014	0.9998
Comp6	.00117669	.	0.0002	1.0000

```
Principal components (eigenvectors)
```

Variable	Comp1	Comp2	Comp3	Comp4	Comp5	Comp6	Unexplained
work	0.4486	-0.0461	-0.1730	0.2748	0.3737	0.7426	0
machine	0.4433	0.0920	0.1427	0.6826	0.1208	-0.5423	0
gdp	-0.2004	0.9619	0.0741	0.0809	0.0652	0.1353	0
first	0.4320	0.0771	0.6149	-0.5487	0.3480	-0.0850	0
finance	0.4467	0.1106	0.1608	-0.0224	-0.8474	0.2092	0
food	-0.4194	-0.2144	0.7350	0.3879	-0.0479	0.2918	0

```
. estat smc

Squared multiple correlations of variables with all other variables
```

Variable	smc
work	0.9979
machine	0.9962
gdp	0.9421
first	0.9647
finance	0.9918
food	0.9873

Table 1. Results of characteristic root and variance contribution

ISSN: 2688-9323

According to the experimental results, it can be seen that the first two component eigenvalues account for 96.2% , and the contribution of the later component eigenvalues accounts for the odd even smile.The principal components with eigenvalues greater than 1 are chosen, so the first two are extracted for investigation.After the SMC test, the SMC of all variables were above 0.8, which can be used for principal component analysis.

The first two principal components are as follows:

Variable	Comp1	Comp2	Unexplained
work	0.4486	−0.0461	.01079
machine	0.4433	0.0920	.02853
gdp	−0.2004	0.9619	.001312
first	0.4320	0.0771	.07942
finance	0.4467	0.1106	.01049
food	−0.4194	−0.2144	.09728

Table 2. Composition of principal components

From the output results, we can see that in the first principal component: the work of rural employees, the power machine of village machinery, the first added value of the primary industry and the cost of department finance have higher load, and they are positively correlated with the first principal component.Therefore, the first principal component can be named photovoltaic industry development index.

As the first principal component explained 81.76%, the influence of PV project index on poverty amelioration effect is more important.According to the composition of the first principal component, we can see that the mechanization of agricultural development, the return of rural labor, the total cost of finance and other factors have promoted the poverty amelioration of Jinzhai County a lot.To a certain extent, this reflects the growth and changes brought by photovoltaic power generation to Jinzhai County: providing more jobs, prompting the advancement of agriculture, the modification of mechanization, and the essential influence exerted by the government during poverty amelioration.

In the second, GDP has a higher load and is positively associated with that, while the total grain output is contrary.Therefore, the second principal component can be named economic development index.

According to the retained two principal components (F1, F2), the poverty amelioration achievement of Jinzhai from 2011 to 2017 was scored (f)

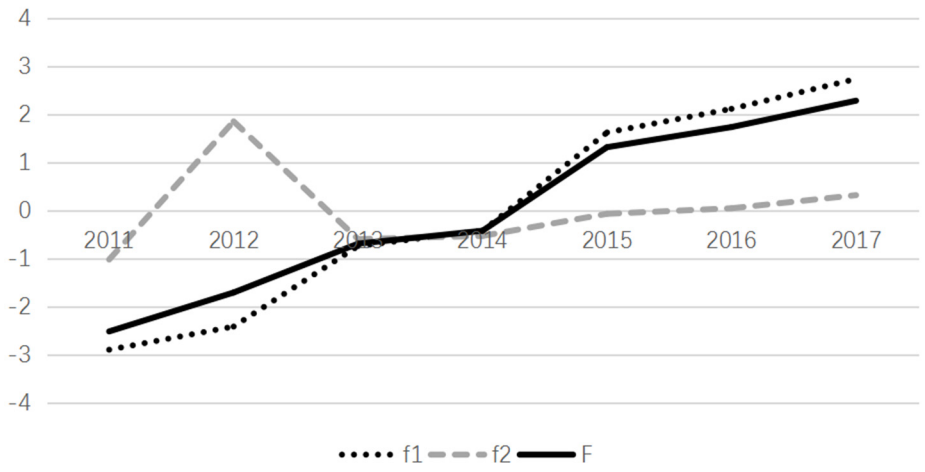

Table 3. Score of poverty amelioration achievement in Jinzhai County

ISSN: 2688-9323

It can be seen that PV project has benefited Jinzhai County a lot. Since the implementation of PV poverty alleviation in 2015, the assessment score has changed from negative to positive, and it will increase rapidly in the next few years.Photovoltaic poverty alleviation promotes the advancement of local agriculture. The growth of the factories provides more jobs, improves the employment rate of Jinzhai County, promotes the progress of commodity sell, and prompts the regional economy.The cost from local department exerts essential impact in the procedure of poverty amelioration in Jinzhai County. In the early stage of poverty amelioration, more money need to be devoted in infrastructure building, and the department's policy affects a lot in that.In addition, with the establishment of the project, the land originally exerted for cultivation will be converted into solar panels, which will lead to the decline of the original production of agricultural products.However, Jinzhai County had many natural disasters due to its inferior geographical position and low output of agricultural products. The development of photovoltaic industry had relatively little impact on agriculture.

4. Analysis of PV Poverty Amelioration in Jinzhai County

4.1. Photovoltaic Poverty Alleviation Business Entity

According to the business entities, industrial poverty alleviation can be divided into:

The main part mode of rural market.In this mode, the main part of pattern is the production cooperative or limited liability company, that is, the collective is set up and operated spontaneously, and the final profit is shared by the collective.Village collective is often used for more collective land, which has the basic conditions to build a large-scale industrial base.

Enterprise contract management mode.That is to say, the enterprise purchases the right to use the collective land of the village, or the two committees of the village coordinate the transfer of the right to use the land.The corporation is liable for the administration and work of the industry. A certain amount of land transfer fee is given to the villagers every year as salary, that is, the loss of land transfer.And pay administration fees and rents to the village collective, as the village collective income.

Enterprise demonstration business model. currently, the farmers still retain the right to use the land, and the enterprises coordinate the farmers to plant certain kinds of cash crops or develop characteristic industries in the form of establishing production demonstration bases and professional cooperatives. the final industrial crops are purchased and sold by enterprises [8]

According to the accomplishment plan of precision poverty amelioration of PV resource production in Jinzhai, the primary body of paying money and department finance of PV poverty amelioration program is an endemic corporation;The construction of PV resource production is in the charge of the endemic department poverty amelioration and immigration Development Bureau, and the money collection and administration is in the charge of the endemic poverty amelioration and growth current administration Co., Ltd.In order to repay the cost of PV resource production program establishment, two thirds of the profit of the first ten years of industrial poverty amelioration will be utilized to repay the loan, and the extra profit will be utilized as villagers' communal asset to motivate the economy.

Therefore, it can be judged that Jinzhai County' s photovoltaic poverty alleviation business entity mode is village market entity mode, that is, the business entity is spontaneously registered by the whole villagers, and the profit of poverty amelioration programs is shared by the village collective.

ISSN: 2688-9323

4.2. The Benefits and Drawbacks of the Primary Mode of Poverty Amelioration in Jinzhai County

1.Advantage

(1) stability

The primary part mode of village market does not involve the interest disputes between enterprises, and the primary part is the community of Jinzhai, which is stable and can avoid the transform of program administration body due to corporation situation and the influence of capital administration terminal on the daily work of the program.The building time of amelioration programs is long, and steady corporations are conducive to the continuous and growth of program building.

(2) Public welfare

The chef part of the cardinal pattern of village agora is the villagers, not corporations and one person, which benefits the local poor villagers.Village collective management makes the dividends of project construction be paid to the poor people, so as to protect the benefits of the poor people from being deducted as a result of market competition and profit-making purposes.In addition, the benefits brought by the scale of the later project will be directly enjoyed by the village collective to maximize the benefits.

2.inferiority

(1) Lack of production and management experience

As the main mode of village market is village collective, it does not have sufficient technology and experience in the generation and building of PV program;However, the PV program has high technical requirements, and the village collective can not be competent for the building of the program independently.

(2) Lack of sufficient funds

The poor counties themselves are relatively poor and lack of funds for the initial construction of the industry. Only relying on the financial support of the government, the current strain will be greater, also impact the security of the current strain of the daily work of the later job heavily;At the same time, the industry can not achieve scale, the profit is limited, and the maximum benefit of poverty alleviation industry can not be brought into play.

(3) Higher standards for the capacity of leadership

The poor counties have relatively low overall quality, lack of experience in industrial construction, and can only rely on their own learning and management without the technical support of foreign enterprises.At the same time, relying too much on the management decision of the leadership will amplify the influence of the leadership transfer on the industrial development.

(4) It is tough to handle the difficulty of profit allocation

During the procedure of poverty amelioration, how to distribute the industrial poverty alleviation profits between the grassroots technical elites and ordinary poor households is an important factor affecting the development of this model.Higher profits can play an incentive role in terms of grassroots governance elites and increase industrial efficiency;However, excessive profit distribution will lose the benefits of the poor and the purpose of amelioration.How to guarantee the enthusiasm of grassroots governance elites and ensure that the poor households can enjoy the benefits of amelioration is an necessary difficulty to be handled.

ISSN: 2688-9323

5. Reference of PV Poverty Amelioration in Jinzhai

5.1. Give Full Play to Geographical Advantages

Jinzhai County is located in the mountainous area. Although there are many natural disasters and the traffic remains unchanged, it has abundant solar energy resources, which creates conditions for photovoltaic power generation.In the case of poor planting conditions, the local agricultural land is transferred to the construction of solar photovoltaic panels to make full use of land resources. While meeting the local residents' electricity consumption, the surplus electricity is stored and sold to the State Grid to obtain income.In the accomplishment of amelioration, industries should be fostered in accordance with local conditions. It is not allowed to blindly introduce industries without investigation, which will have adverse effects on regional industrial development and aggravate poverty.

5.2. Give Full Play to the Responsibility of Local Department

The development of the photovoltaic industry in Jinzhai County has an essential association with the total cost of the department. In the primary procedure of the PV program, so much current needs to be input in foundation building and skills training, which can not be achieved only by relying on the strength of the villagers.During the building, the department ought to exert its function, and provide capital and policy for industrial growth.At the same time, in the procedure of fostering the industry, we should avoid the phenomenon that the government interferes with the regional industry excessively, and the administrative dominant power is too large to prevent the farmers from losing their enthusiasm.In addition, during the whole procedure, the department needs to promote the regional organizations to clarify the droits, improve the rural administration, and prompt the steady growth.[9]

5.3. Give Adequate Free to the Enthusiasm of the Corporations

According to different business entities, the poor areas should seek virtues and drawbacks, and lend adequate free to the enthusiasm of different business entities.For example, the mode of company supervision should cope with the association between the instruction of the section and the behavior of primary factories, so as to abstain the inactivation of industrial development caused by excessive government intervention;At the same time, we should also regulate the profit seeking behavior of leading industries.The essential goal of that is to guarantee that the people in poor counties are the final winners, and truly achieve amelioration.In addition, through the growth of rural organizations, we can fully mobilize the enthusiasm of farmers to build property, so that farmers can become the real beneficiaries of industrial poverty alleviation. [2]

5.4. Promote the Transformation of Regional Agricultural Modernization

Because of its tough situation, the growth of conventional agriculture in Jinzhai is difficult and restrained by many factors.As a long-term dependent area of agricultural development, the poor counties need to promote the transformation of the original agriculture, develop modern agriculture, make up for the disadvantage of geographical location with science progress, and add output.Therefore, the department ought to purchase modern technology, strive to provide advanced technique for the project, so as to guarantee the steady growth of the program.

5.5. Enhance the Training of the Primary Body

With the development of photovoltaic industry, Jinzhai gradually motivates the people to participate in jobs, which reflects the rise of work on the one hand and the return of people on the other.This project is not to improve the villagers in poor areas by industry, but to cultivate the local residents' skills through that.Therefore, for the primary part of the project, the government and relevant institutions need to increase training, so that poor households can

ISSN: 2688-9323

really master skills and participate in the process of industrial development.The training needs to be layered in batches, so as to provide different skills and knowledge for different groups, cultivate labor force at all levels, and ameliorate the general work effectiveness of the project.

References

[1] Hua Lingxiao, Xu Yueming. Survey on poverty alleviation mode of industry in Lang County, Tibet [J]. Cooperative economy and technology, 2018 (06): 156-157.

[2] Hu Zhenguang, Xiang Deping. Development bottleneck and improvement path of industrial poverty alleviation from the perspective of Participatory Governance [J]. Learning and practice, 2014 (04): 99-107.

[3] Yang long, Li Baoyi, Zhao Yang, Wang Sangui. Research on Multidimensional Poverty targeting of agricultural industry poverty alleviation [J]. China population, resources and environment, 2019,29 (02): 134-144.

[4] Li Donghui, Qiao Luyin. From industrial poverty alleviation to industrial prosperity: Industrial Development Dilemma and innovation trend in poor areas [J]. Seeking truth, 2019 (06): 81-91 + 109-110.

[5] Niu Shengqiang. Industrial poverty alleviation dilemma and development ideas in deep poverty areas under the background of Rural Revitalization [J]. Theory monthly, 2019 (10): 124-131.

[6] Chen en. Why is poverty alleviation by industry easy to fail--Analysis on the structural dilemma based on the energy increase of poor households [J]. Journal of Northwest A & F University (SOCIAL SCIENCE EDITION), 2019,19 (04): 87-95.

[7] Zhuo Fuyan, Xia Bing, Wan Kejiang. Giving full play to the advantages of cadres and talents to promote the poverty alleviation of agricultural industry -- Taking the poverty alleviation of buckwheat industry in Kangbao County of Hebei Province as an example [J]. China agricultural technology promotion, 2020,36 (12): 5-7.

[8] Zeng Qingjie, Niu Yiqin. Industrial poverty alleviation model in rural governance and its performance evaluation [J]. Journal of Nankai (PHILOSOPHY AND SOCIAL SCIENCES), 2019 (04): 87-96.

[9] Xing Jing, Yu Guang. Research on transformation and upgrading of agricultural modernization in Jilin Province [J]. Southern agriculture, 2019,13 (27): 106-108.