Research on Building Model of Rural Green Industry Evaluation Index System Based on Computer Factor Analysis Technology

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Abstract. In fact, in order to establish a good evaluation system of rural green industry, we need to evaluate and standardize the development standards of rural green industry as the key point of research. It is also necessary to establish a scientific evaluation index for the comprehensive analysis of the socialist rural green industry. In the process of evaluation of green industry in rural areas, the factor analysis under computer technology can screen out each kind of information index[1]. The computer can ensure that the selected indicators have the greatest impact on the evaluation results. In this case, the selected indicators can also cover all aspects of green industry evaluation.

Keywords: Computer, Factor Analysis, Rural Green Industry

1. Introduction

In each country's government pays attention to the progress of China's economic strength, in order to achieve the goal of sustainable economic and social development, we must vigorously develop China's green industry. At present, with the progress of the times, the progress and renewal speed of rural green industry become faster. In fact, rural green industry refers to the rural related enterprises that can improve the environment and increase economic benefits[2]. The establishment of a reasonable index system is the key element of industrial evaluation and standardization.

Before the concept of green industry was put forward, the application of factor analysis technology of computer was very single. After the factor analysis technology has been developed, people like to use the analysis technology to carry on the economic evaluation of a certain region's industry. With the passage of time, people find that the effect of factor analysis in economic evaluation has become very mature. After the emergence of rural green industry, it has expanded the use of factor analysis technology. It can be seen that it is suitable for the work content of computer analysis technology.
2. Research status of evaluation index system of rural green industry at home and abroad

2.1. Evaluation index of green industry of foreign authoritative organizations

In fact, the number of typical foreign research authorities is large. We can give a few practical examples. A comprehensive environmental indicator system for cities deployed by the United Nations Environment Program. World economic evaluation system related to the world bank. International ecological indicators constructed by the Swiss Institute of international management. Key indicators of urban green ecology constructed by the world environmental protection association.

2.2. Evaluation index of green industry of China's authoritative institutions

In fact, the authoritative research institutions in China started relatively late. Therefore, the academic level of our authoritative institutions is relatively low. At present, China's more famous green industry evaluation institutions mainly include: green energy-saving industry index evaluation of energy-saving service committee construction, scientific and technological ecological green evaluation index of science and technology department construction, green evaluation index of green Beijing issued by Beijing (see Figure 1).

![Figure 1. Rural green industry](image)

2.3. Other theoretical evaluation index system

According to a large number of literature review, we can find that the development direction of the evaluation index system mentioned in other academic literature mainly includes five aspects. They include comprehensive science and technology, including science and technology[3]. In addition, there are other green evaluation indicators of prefecture level cities in China. Some evaluation indexes of science and technology in theory can also be developed by means of literature aggregation.

3. Research on the screening method of rural green industry indicators

3.1. Subjective index selection based on experts' work experience
In general, the scoring method of experts is a common way to select indicators. The selected indicators include not only the evaluation index of green industry, but also the performance evaluation index of low-carbon industry. In addition, the use of scientific and technological evaluation methods can also be used to evaluate the indicators of green industry and the selection of evaluation indicators of scientific and technological innovation.

3.2. Objective screening method based on quantitative analysis

In many cases, the stage comprehensive screening method can be used to evaluate the indicators of green industry and large-scale scientific and technological innovation enterprises. The use of factor analysis method can also put forward the influence results of green industry evaluation index. However, the forms of the above two analytical methods are objective. Therefore, some objective factors may affect the accuracy of the final results. This is a problem that scholars should pay attention to.

3.3. Comprehensive narration

According to the comprehensive thinking of the above conclusions, we can find that the defect of the subjective screening method is that the subjective randomness is very strong. In this way, it is difficult to grasp the specific meaning of personal experience and indicators. On the other hand, the defect of objective screening method is that it is easy to make people believe and rely on index data excessively. This approach may ignore the actual meaning of the indicators.

4. Construction of evaluation index system model of rural green industry based on computer factor analysis technology

4.1. The basic points of index system construction

The development of green industry refers to the progress of high output and low pollution enterprises' interest groups based on the reduction of raw materials and consumables by cleaner production technology. If we can enhance consumers' awareness of green consumption, we can ensure that the sustainable development strategy of China's society, economy and ecological environment can proceed smoothly[4]. According to the definition described above, we can determine that the evaluation index system of green industry in rural areas in this study should include three standard layers. They include: green production, green consumption and green environment. Before constructing the green index system, we need to delete the relevant quantifiable indicators according to the observability principle. This method can ensure that the indexes after preliminary screening meet the application requirements.

4.2. Green industry indicators of the audition criteria

According to the principle of index selection of computer factor analysis technology, the standard requirements of index selection should be paid attention to. The maximum standard of index information content and the standard of deleting redundant index information are two important principles of index selection. According to the information content of each year's indicators, we can see the impact degree of green industry evaluation indicators. The greater the content of information, the greater the impact of indicators on the evaluation of green industry. Through the factor analysis technology of computer, the selection of the same kind of index should pay attention to the huge
amount of information.

4.3. The basic principle of index system construction

Through the combination of r-clustering and factor analysis, we can establish an index evaluation system including 26 indexes. These indicators include green production, green consumption and green environment. The construction principle of rural green industry index evaluation system based on computer factor analysis is shown in Figure 2.

![Diagram of index system construction](image)

**Figure 2.** Construction of rural green industry index evaluation system based on computer factor analysis

5. Empirical Study on the construction model of rural green industry evaluation index system based on computer factor analysis

5.1. Sample selection

In order to ensure the accuracy of the experimental data, we need to take the actual regional green industry research. This paper will choose a rural area in Shenyang City of Liaoning Province as the sample data of the experiment. We regard green industry as the main innovation point of revitalizing the northeast old industrial base. According to the survey, Shenyang is building a national forest city. In order to achieve this important goal, it is necessary to establish the evaluation index model of rural green industry[5].

5.2. Indirect calculation index

According to the literature review, we can find that the conversion rate of green energy processing in each year can be written as the ratio of output and input of energy processing. The formula is as follows:

\[ ER_i = \frac{E_O}{E_I} \]

The elasticity coefficient of energy consumption should be equal to the ratio of consumption growth and total growth. The specific formula is as follows:
After the standardization of the green industry audition index, we can carry on the final green industry index evaluation.

5.3. Index selection of evaluation index system model based on computer factor analysis

Table 1. Evaluation index of green industry based on factor analysis of computer

| Serial number | Criterion layer                          | Indicator name                                 |
|---------------|------------------------------------------|-----------------------------------------------|
| 1             | GDP water consumption                     |                                               |
| 2             | Green consumption, green production and green environment | Standard rate of industrial wastewater |
| 3             |                                           | The ratio of green tourism industry to GDP     |
| 4             |                                           | Exhaust emission rate                          |
| 5             |                                           | Pollution control of green industry            |

6. Conclusion

According to the data statistics of this experiment, we can see that the construction of rural green industry evaluation index system model based on computer factor analysis technology is relatively complex. Through the analysis of multi-level data, we can see that the establishment of index evaluation model has high requirements for computer technology\(^6\). This article borrows the real rural case, through the index measurement, discovered the rural green industry development degree and people's green consumption idea popularity.

Acknowledgments

This work was financially supported by 2020 social science planning research project of Shandong Province "Study on the construction and application of high-quality development index system of Rural Green Industry". Project number: 20CPYJ26.

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