

Research on Eco-theoretical Framework of Coal Resources Capitalization Based on Condensed Subgroup

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Abstract—In recent years, China regards the construction of ecological civilization as the fundamental strategy for the sustainable development of the country, which naturally becomes the guiding ideology of the capitalization theory of coal resources. This paper is problem oriented, using ROSTCM6 UCINET software, focusing on coal resource capitalization and the core content of ecological civilization construction, using condensed subgroup method to construct a ecology theory framework of coal resource capitalization

Keywords—condensed subgroup method; coal resources; capitalization; ecological theory

I. INTRODUCTION

The "ecological" theory of coal resource capitalization is a theory of coal resource capitalization revealed from the angle of "ecological civilization". China's research on "capitalization of coal resources" began in 2000, and its essence is "paid mining". In fact, China's coal resources were allocated by the state to enterprises for free mining before 1999, but from 2000 to 2007, China's stock of coal resources and incremental coal resources in the country's mineral resources first fully realized paid mining [1], That is to say, enterprises need to purchase mining rights to mine coal, but so far there is no theoretical system of capitalization of coal resources related to "ecological civilization". This paper does some research.

II. CONSTRUCTION METHOD AND THOUGHT OF "ECOLOGY" THEORY OF CAPITALIZATION OF COAL RESOURCES

A. Construction Method

The first is to use the effective method of constructing accounting theory for reference [2]. This is the most basic and important method. Because the concept of "capitalization" defined in China's "Economic Dictionary" originated from accounting concept, which means that accounting classifies some expenditure as "capital expenditure" and carries out "capitalization" management method [3]. The capitalization of coal resources is based on the connotation of accounting capitalization.

The second is to draw lessons from the previous research results in the theoretical construction of effective methods. There are four commonly used methods: pragmatism, authoritarianism, deduction and induction. Since the introduction of coal resource capitalization in 2000[4] (after the appearance of the first article), only one article on "accounting treatment of coal resource capitalization" has appeared in China Journal Network[5]. This article adopts a pragmatic approach to accounting treatment. Then from the "National Library of China·National Digital Library of China" to search for the "book" of "capitalization of coal resources", only Zhu Liangfeng's "Study on Supporting Theory and Operating Efficiency about Capitalization of Coal Resources" in 2017 is a monograph [6]. This monograph uses deductive method to describe the basic framework of the ecological theory of coal resource capitalization, which can provide useful reference for this paper.

Thirdly, combining with the characteristics of the times, we should use innovative theoretical construction methods. This innovative method is mainly "condensed subgroup method". It is a sociological method of word segmentation, clustering and focusing on documents, articles, speeches, events and acts (including specialized channels and network channels) that are widely collected by software. Since the theory of coal resource capitalization in China is still in its infancy, this systematic theoretical system has not yet been formed, various scattered viewpoints need to be sorted out and upgraded, and to integrate into the advanced theories, ideas and ideas of the new era, the "condensed subgroup method" can better reflect the new requirements of building an innovative theoretical system.

B. Construction Thoughts

First, guided by the general goal and requirements of the construction of "ecological civilization" in today's society, guided by the existing problems in the development and utilization of coal resources; Secondly, guided by the development of coal economy in the past, especially based on the practice and research results of the development and utilization of coal resources, a theoretical framework is formed by focusing on the research content with the method of

"condensed subgroup". Third, The framework structure of the ecological theory of coal resources capitalization is constructed. Among them, referring to the construction method of accounting theory, the basic theory is put forward to the front of the branch theory, so that the branch theory is delineated within the scope of the research subject and built on the platform of the basic theory.

III. CONSTRUCTING THE ECO-THEORETICAL FRAMEWORK OF CAPITALIZATION OF COAL RESOURCES BY CONDENSATION SUBGROUP METHOD

The condensed subgroup method is an innovative method to construct a theoretical framework in today's society. The theory created by this method not only originates from practice, but also can guide practice well. It not only promotes accounting practice to the height of accounting theory, but also raises social practice to the theoretical height of economic management and social management. The innovative application of this method is not the innovation of the method itself, but the innovation of the object and result of the method application. It is the fundamental point that this method is applied to the construction of resource management innovation theory, which is different from other theory construction methods.

A. Guided by the National Policy of "Ecological Civilization"

Since October 2007, the 17th and 18th congresses of the Communist Party of China have put forward the goal of "building an eco-civilization" country. They have made "building an eco-civilization" an important part of the overall layout of the cause of socialism with Chinese characteristics and "integrating it into all aspects of economic construction, political construction, cultural construction and social construction" and the whole process. In order to implement this goal, in August 2016, Fujian Province was listed as a "national ecological civilization pilot area" to build [7]. On August 23, 2016, Chinese President Xi Jinping asked Qinghai Province to do a good job of development and utilization under the premise of protecting the ecological environment [8]. On March 5, 2019, Xi Jinping also asked Inner Mongolia to "explore a new way of high-quality development oriented by ecological priority and green development". The introduction of these policies by the state and the requirements put forward by the state leaders should be the guiding ideology of the "ecological" theory of coal resource capitalization.

B. Guided by the National Policy of "Ecological Civilization"

1) *Word segmentation and word frequency analysis using "ROSTCM6" software*: ROST Content Mining System User Manual Version 6.0 was developed by the ROST Virtual Learning Team of Wuhan University in September 2010.

The important functions of the system are: segmentation, character frequency statistics, word frequency statistics, clustering, classification, emotional analysis (including simple and complex), co-occurrence analysis, and co-occurrence analysis for papers, microblogs, blogs, forums, webpages, books, chat records, e-mail, local text format files, various text fields in the database. Citation analysis, dependency analysis,

semantic network, social network, co-occurrence matrix can also be analyzed. Using these functions to construct the theoretical framework of coal resource capitalization is as follows:

a) *Collect five thematic articles*: Through China HowNet (CNKI) and Chinese Social Sciences Citation Database (CSSCI), we collected articles about "resource conservation", "environment friendliness", "harmonious coexistence", "sustainable prosperity", "ecological industry", especially "overview", and downloaded the text in the format of *.txt. Using "ROSTCM6" software for word segmentation, word frequency table is generated. The table extracts part of content: First, resource conservation category: technical words frequency 370,000, research words frequency 340,000, economic words frequency 260,000, and so on. Second, the category of environmental friendliness: the frequency of environmental words is 2.7 million, the frequency of developing words is 1.45 million, the frequency of social words is 1.38 million, and so on. Third, the harmonious symbiosis category: the frequency of developing words is 2.82 million, the frequency of innovative words is 69,000, the frequency of ecological words is 530,000, and so on. Fourth, the category of sustained prosperity: 128,000 economic words, 89,000 Chinese words, 560,000 green words, and so on. Fifth, the category of eco-industry: the frequency of eco-words is 5.9 million, the frequency of development words is 2.2 million, the frequency of clean words is 1.35 million, and so on.

b) *Collect articles on "capitalization of coal resources"*: The table contains 3.37 million words of coal, 3.27 million words of resources, 1.25 million words of enterprises, 1.17 million words of capital, 880,000 words of marketing, 860,000 words of value, 480,000 words of China, 450,000 words of mining, 430,000 words of property rights, 420,000 words of methods, 420,000 words of state and 410,000 words of management. Ten thousand words, 380,000 words for exploration, 350,000 words for coal mines, 340,000 words for owners, 330,000 words for assets, and so on.

c) *Word frequency matrix is compiled*: Based on the word frequency of coal resource capitalization and the word frequency of five research hotspots, a word frequency matrix (same word frequency summary, elimination of useless word frequency such as research institute) is compiled. See Table I:

2) *Using UCINET software to analyze network density to form a visual structure chart*: UCINET (University of California at Irvine NETWORK) is a powerful social network analysis software. It was originally written by Linton Freeman, an authoritative scholar of social network research at the University of California, Irvine, and later expanded by Stephen Borgatti. Stephen Borgatti, Martin Everett and Linton Freeman. The software includes NetDraw for one-dimensional and two-dimensional data analysis, Mage for three-dimensional display and analysis, etc. It also integrates Pajek's Free application program for large-scale network analysis. Using UCINET software, we can read text files, KrackPlot, Pajek, Negopy, VNA and other formats, and do centrality

analysis, subgroup analysis, role analysis and permutation-based statistical analysis, especially with strong matrix analysis function.

Input frequency of Coal resources capitalization and ecological civilization into UCINET software to form “*.###” File—Form “* GTO.### ” file by "transformation" and "bisection"—Through the operation of "network", "cohesion" and "density", the average value of density matrix is 0.6347 (standard deviation is 0.4815)—Through the operation of "visualization", "network" and "opening", the following "visualization structure chart of ecological theory of coal resource capitalization" is formed.

There are six small boxes in the visualized structure chart of ecological theory of coal resource capitalization. it can be seen that the "capitalization" box is on the right, while the "resource conservation", "environment friendliness", "ecological industry", "harmonious coexistence" and "sustainable prosperity" box are on the left from top to bottom. The six boxes are in the center, with the matrix average density of 0.6347.

3) *The Framework of Ecology Theory Based on the "agglomerated subgroup graph" of network centrivity:* A cohesive subgroup is a subset of actors. In this subset, there are direct, close, relatively strong, frequent or positive relationships among actors, which can reveal and characterize the sub-structure state within the group, including the number of cohesive subgroups in the network, which city members each cohesive subgroup contains, the relationship between cohesive subgroups, their connection modes and dimensions of cohesive subgroups,etc.

Using UCINET software, through the operation of "network", "role & location", "structure" and "CONCOR", the "cohesive subgroup diagram of ecological theory framework of coal resource capitalization" is generated. See Fig.1:

IV. REVEALING THE THEORETICAL FRAMEWORK OF "ECOLOGY" FOR CAPITALIZATION OF COAL RESOURCES

From Fig. 1, it can be seen that the ecological theory of coal resource capitalization consists of six parts: basic theory of apitalization, ecological industry theory (determined as "the main line development theory of ecological industry"), harmonious coexistence theory, environmental friendliness theory (determined as "environmental protection theory"), resource conservation theory and sustainable prosperity theory (defined as "benign cycle sustainable development theory of capitalization"). Since "basic theory of apitalization " is the combination of concepts and principles, and the basis of other

theories, it is put forward to the front of the theoretical framework. The other theories are a logical juxtaposition relationship, which can be collectively called "branch theory of capitalization" and developed on "basic theory of apitalization ", thus forming the "ecological" theory of coal resources capitalization on the frame diagram, see Fig. 2:

V. RESEARCH CONCLUSIONS

China's coal resource capitalization has not formed a complete theoretical system since it was put forward in 2000. The original intention of capitalization of coal resources in China is to give value to coal resources, change the long-term unpaid mining into paid mining, and realize the capitalization operation of coal resources. With the reform of China's coal resource management system, China's coal economy has been booming since 1978, when China implemented reform and opening-up policy. However, the pursuit of capitalization of coal resources has brought some negative effects. The prominent manifestation is the destruction and pollution of the environment. In recent years, China has integrated the construction of ecological civilization into all aspects of economic construction, political construction, cultural construction and social construction, and the concept of ecological civilization has naturally become the guiding ideology and corrective policy of coal resource capitalization theory. The paper is problem-oriented and based on social practice.ROSTCM6 and UCINET software are used to focus on the core content of coal resource capitalization and ecological civilization, and the "cohesive subgroup method" is adopted to form the framework (path) of the "ecological" theory of coal resource capitalization, which includes two parts: the basic theory of capitalization and the branch theory of capitalization. The latter consists of five theories: conservation theory of capitalization,environmental protection theory of capitalization[9], harmonious coexistence theory of capitalization, main line development theory of ecological industry of capitalization and benign cycle sustainable development theory of capitalization.Drawing lessons from the construction method of accounting theory, the basic theory of capitalization is promoted to the front end of the ecological theory framework of coal resource capitalization, so that the other branches of theory are delineated within the scope of the research theme and built on the platform of the basic theory. As the ecological theory of coal resource capitalization in China is in the early stage of theoretical construction, the paper can only build a theoretical framework, although there are some explanations, but it is still very extensive. It only shows the theoretical "outline" and plays an important role in attracting new ideas. Researchers in the future will continue to supplement, improve, deepen and expand it.

TABLE I. MATRIX FREQUENCY TABLE OF CAPITALIZATION OF COAL RESOURCES AND ECOLOGICAL CIVILIZATION (UNIT: 10000)

	Capitalizatio n	resource conservation	environment friendliness	harmonious coexistence	sustainable prosperity	ecological industry
coal	337	135	82	80	96	168
Resources	332	14	73	68	8	73
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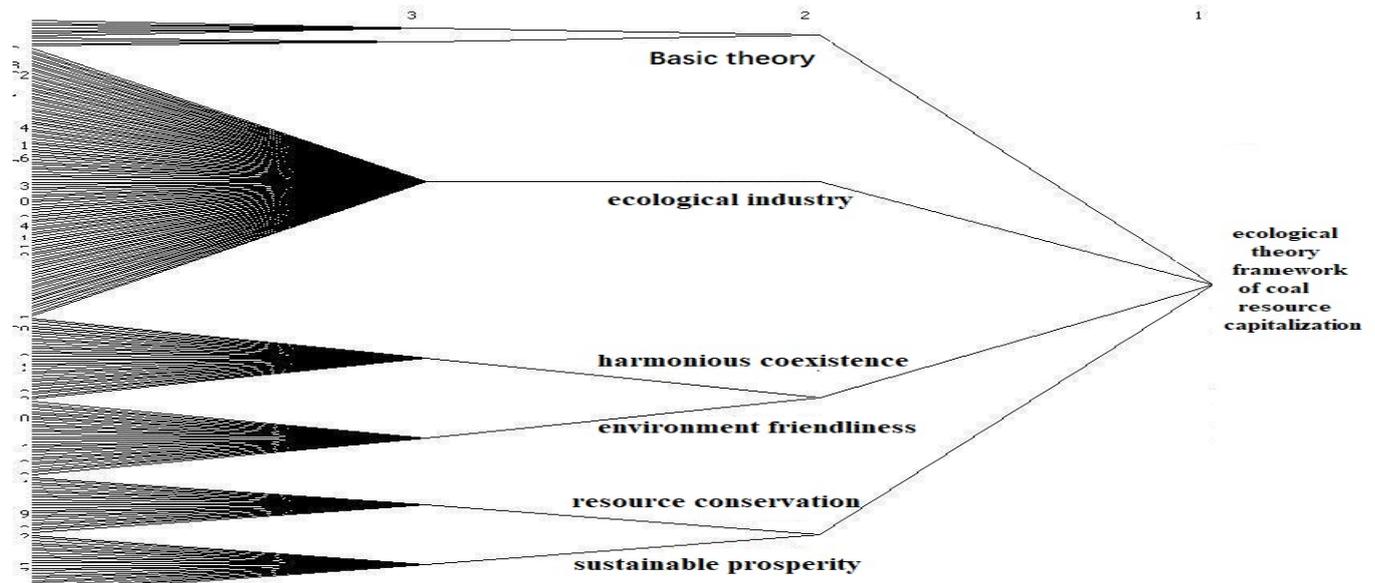


Fig. 1. Cohesive subgroup diagram of ecological theory framework of coal resource capitalization.

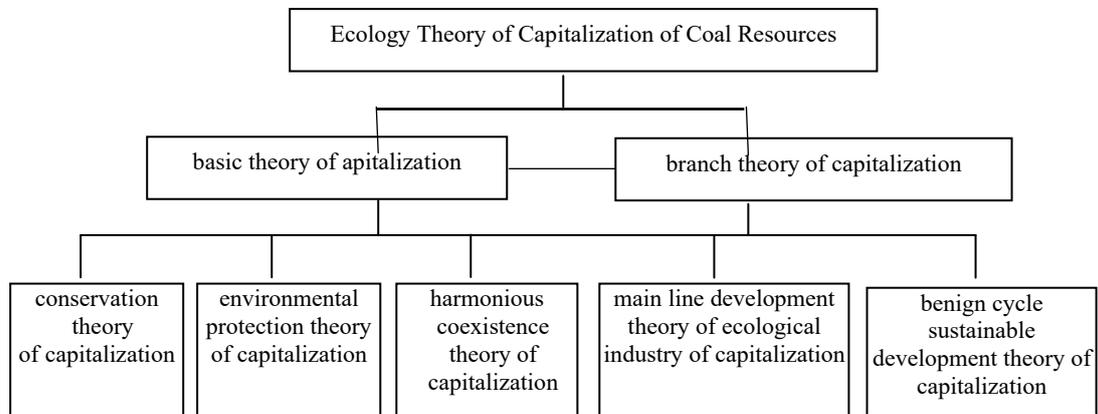


Fig. 2. The theoretical framework of "ecology" for capitalization of coal resource.

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REFERENCES

[1] X.Y. Zhu, et al, Research on the theory and application of mineral resources equity [M]. Xuzhou: Social Sciences Academic Press(China), 2008
 [2] Ahmed Riahi-Belkaoui.Accounting Theory (4th Edition) [M], Shanghai: Shanghai University of Finance & Economics Press,2004-05.
 [3] Dacihai Editorial Committee, Dacihai:Philosophy Volume [M]. Shanghai: Shanghai Dictionary Publishing House, 2003, vol. 08, pp. 107-108.

[4] Z.Y. Shen, X.Y. Zhu, Capitalization: A Strategy for Sustainable Utilization of Coal Resources [J]. JOURNAL OF CHINA COAL ECONOMIC COLLEGE,2000, vol. 1, pp. 66-69.
 [5] Z.W. Wang, Thoughts on Accounting Processing of Capitalization of Coal Resources [J]. Modern Business,2012, vol. 11, pp. 251-252.
 [6] L.F. Zhu, Stuty on Support Theory and Operation Efficiency about Capitalization of Coal Resources [M]. Beijing: China Economic Publishing House,2017.
 [7] China Civilization Network. Fujian has become the first experimental area of ecological civilization in China[EB/OL].[2016-08-24]. http://www.wenming.cn/syjj/dfcz/fj/201608/t20160824_3615618.shtml.
 [8] Sina Public Welfare Network. Xi Jinping's Qinghai Inspection: Developing and Utilizing Well on the premise of Protecting Ecology [EB/OL].Beijing Times.[2016-08-3].<http://gongyi.sina.com.cn/gyzx/hg/20160823/docifxvcsrm2257977.shtml>.
 [9] L.F. Zhu, X.Y. Zhu, "Energy policy, market environment and the economic benefits of enterprises: evidencefrom China's petrochemical enterprises,"[J] Natural hazards, 2019, vol. 95(1-2), pp. 113-127.