

Connotation Discussions and Policy Proposals for Constructing a “Great Power of Mineral Resources”

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Abstract: This paper aims to clarify the emerging concept of the “great power of mineral resources” in China and to offer some policy proposals based on the development of the international mineral resource industry. First, we analyzed the intentions of the concept of “great power” that have existed in history, and extended them as the intentions and definitions of the “great power of mineral resources” after analyzing the characteristics of the mineral resources industry. Next, we examined the definition through case analysis of the mineral resource industries in the United States and China. Finally, we proposed that the “great power of mineral resources” be defined as “a specific nation that has the goal to promote the sustainable development and global governance of mineral resources, possesses the capability to exert its influences on production, finance, governance, and knowledge structure of the global mineral resource industry, and thus can maintain its own political and economic interests”. To develop a “great power of mineral resources”, China should enhance its influence on finance, governance, and knowledge hierarchy of the global mineral resource industry based on its strong production capability.

Keywords: mineral resource; great power; sustainable development; global governance

1 Introduction

The mineral resource industry is a basic industry that provides materials for any economy through its related activities such as exploration, mining, processing, trading, and recycling of various kinds of mineral resources. At the same time, the mineral resource industry is related to the financial industry, public management by the government, talent education, knowledge culture and other supporting industries. With the advancement of industrialization, urbanization, and modernization, China’s mineral resources industry has developed and expanded rapidly, making China a major country in the production, consumption and trade of mineral resources across the world. While supporting the economic and social development of China, the mineral resources industry has also generated significant impacts on the international market. However, there are still many challenges to the development of the mineral resource industry in China, including lack of influence over international mineral prices, severe environmental destruction, overcapacity of production, and wastage of resources. The Chinese society has in recent years come to a consensus that China’s mineral resource industry is “a giant but not powerful”.

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In the face of these challenges, many leading experts have raised the new concept of the “great power of mineral resources”, particularly in the international market, to address the lack of pricing and discourse power. In the research report titled *Strategic Research on Sustainable Development of Mineral Resources in China*, Chinese Academy of Engineering and Tsinghua University proposed that “We should strive to build a powerful country in mineral resources, promote China’s transformation from a large economic power to a strong economic power, and provide a strong material basis for building a strong country” [1]. However, there is still no clear definition of what characterizes the “great power of mineral resources” and how a nation can become a “great power of mineral resources”. Moreover, few works have been published on the concept of the “great power of mineral resources” since it is a new concept.

Based on the logistics, this paper analyzes the concept of the “great power of mineral resources” and finally defines it. Although the concept is new and there is limited corresponding research, there have been alternative discussions on the concept of “great power” in both Chinese and Western societies. Therefore, this paper first analyzes the conception of “great power” in the history of China and foreign countries, and then explores the intention of “great power” within the current international context. The study then extends the connotation and definition of a “powerful country of mineral resources” according to the characteristics of the mineral resources industry. The cases of the United States and China are analyzed within this context, and the connotation obtained is tested; finally, the results obtained from the concept analysis in this paper is used to provide some policy suggestions for the development of China’s mineral resources industry.

2 The concept of “great power”

In the history of China, a “great power” has been understood as a powerful country. The “great power” mentioned in a chapter of the book *Guan Tzu* which was written in the Spring and Autumn Period (770 BC—221 BC) was achieved “by forming alliance with great powers and making small powers as vassal states, all these powers will follow Qi’s instructions whether Qi takes actions or not” [2]. As mentioned in the chapter “Wen Yi” in *Wen Chung Tzu*, a “great power” conquers other powers by military forces, an “overlord power” makes others obey by intelligence, a “king power” commands others by justice, an “empire power” rules others with moral integrity, and an “imperial power” rules all the land by inaction (letting others take their own course [3].

With the development of globalization and the emergence of global environmental problems, more and more countries are engaging in international cooperation with the objective of realizing sustainable development for all mankind. Countries discuss and decide on international affairs through the technique of global governance. It is different from the historical practice in which military conquest and military strength determine international affairs. In the current historical context, the goal of a “great power” is no longer to manage other countries, but to promote sustainable development and global governance. Additionally, in order to exert its influence, the ability of a “great power” has gradually expanded from military to production, finance, governance, knowledge, and culture. Meanwhile various economic industries have gradually become the points of exerting national influence. Some experts and scholars in China have also begun to study the issue of “great power” and to put forward the concepts of the “great power of manufacturing”, “great power of the mining industry”, and so on.

Strange (1988), a famous British political economist, proposed the theory of structural power for studying the patterns of influence between subjects in international political and economic relations [4]. According to Strange, two kinds of powers can be exercised in the global political economy: relational power and structural power. Relational power is the power to influence other nations to do something. Structural power, which is more important in the international system, is the power to shape and determine the structures of a global political economy. Strange summarized four basic structural powers. These powers form a transparent pyramid of national functions that control other nations, namely production, finance, security, and knowledge. These four structures determine the ability of a power to influence other powers, which means that any potentially great power in a system should have advantages in these four structures in addition to having relational power.

Based on the understandings mentioned above, we update the conceptual system of the intention of “great power” according to the present day international background. Today, a great power can be defined as a country that aims to promote sustainable development and global governance and is able to exert influence on other nations; its influence typically stems from its strength in production, finance, governance, and knowledge.

3 Intention and definition of the “great power of mineral resources”

Based on the analysis of the extent and intention of the concept of “great power,” we combine the

characteristics of the “great power of mineral resources” with the characteristics of the mineral resources industry.

First of all, referring to the analysis of the four structures of the strength of great power, we can classify the main bodies involved in the mineral resources industry. The main bodies related to the mineral resources industry in a country include the mineral resources enterprises, the financial industry, the government, industry organizations, international institutions and scientific research institutions. The main bodies can be divided into four levels: production level (the mineral resources industry chain), financial level (banks, investment institutions, exchanges), governance level (government, international organizations), and knowledge level (universities, scientific research institutions). These four levels of the bodies and the interrelations between them determine the way and extent of a country’s influence on the global mineral resources industry. Among them, the main bodies at the production level directly affect the allocation and mode of production of global mineral resources; the main bodies at the financial level indirectly affect the production relationship and market price of mineral resources through the functions of currency, capital operation, and futures market; the main bodies at the governance level restrict the behaviors of other main bodies by influencing the global governance system and formulating rules and standards; the main bodies at the knowledge level affect the decisions and thoughts of other subjects through the dissemination of information. Therefore, a “great power of mineral resources” should have an advantageous position across the four levels in the global mineral resources system.

For example, at the production level, a “great power of mineral resources” can allocate global mineral resources and dominate international market prices through multinational companies; at the finance level, a “great power of mineral resources” can guide the prices of international mineral resources through the price discovery function of the futures market, while financial institutions play a huge role in the investment in global mineral resources; at the governance level, a “great power of mineral resources” can lead the market rules, trade rules, and industry standards of international mineral resources through global governance, build rules and regulations, and guarantee the safe supply of its own mineral resources through diplomacy and other means; at the knowledge level, a “great power of mineral resources” can influence the development of the global mineral resources industry through knowledge culture, technological innovation, information dissemination, and other means.

On this basis, this paper defines a “great power of mineral resources” as “a specific nation that has the goal of promoting sustainable development and global governance of mineral resources, possesses the capability to exert its influences on production, finance, governance, and knowledge structure of the global mineral resource industry, and thus can maintain its own political and economic interests.” The basic connotation of this definition is that a “great power of mineral resources” is an important participant in the production and trade of mineral resources, and is closely related to the ruling system and the rise and fall of the international mineral resources industry. Its goal should be to promote the sustainable development and global governance of mineral resources, and to have a greater impact on the global mineral resources industry system. Its influence comes from the support of the different levels of structural power namely, production, finance, governance and knowledge.

4 A test of the definition of a “great power of mineral resources”

The definition of a concept should be able to accurately describe the objective things represented by that concept. The United States is recognized as a great power in the world today. It has a great influence on the global mineral resources industry and the international market, and it is a real great power of mineral resources. As a major participant in the mineral resources industry, China has a significant impact on the global mineral resources market. Therefore, this paper uses the cases of the United States and China to test the definition of a “great power of mineral resources.”

4.1 The case of the United States

The United States is the largest economy and the most powerful country in the world, and its exploitation and utilization of mineral resources is of great significance in maintaining its hegemony. With the end of the cold war and the completion of industrialization, the focus of the US mineral resources industry has shifted from the acquisition of global mineral resources to environmental protection and resource recycling. With the rise of developing countries, the United States has more approaches to solving international affairs through global governance [5]. It can be seen that the United States has the goal of promoting sustainable development and global governance, which is consistent with the goal of a “great power of mineral resources.” On this basis, we can analyze the status of the United States as a “great power of mineral resources” from the perspective of the four levels of the mineral industry bodies.

Production: The United States pays considerable attention to its access to global mineral resources. Before World War I, the United States controlled the mineral resources in the nations around it (e.g., nickel in Canada, copper in Chile, bauxite in Guyana) and even mineral resources in Africa, which helped in attaining industrialization [5]. Since the twentieth century, transnational corporations in the United States have invested actively in global mineral resources, such as the resources in Canada and Australia, and have promoted the development of the mineral resource industry worldwide. These transnational corporations strengthened their international competitiveness through mergers and acquisitions and finally determined the industrial structure and regional patterns of the global market.

Finance: The United States has the largest crude oil market in the world, the New York Mercantile Exchange (NYMEX) has been trading oil futures since 1983, and the United States succeeded in maintaining the monopoly of the US dollar in the global oil trade. West Texas Intermediate (WTI) is now used as one of the benchmarks in oil pricing and also as a tool to guide the trend of the global oil price. The Commodity Exchange of New York (COMEX) provides for the trading of gold, silver, and copper futures and owns the largest gold futures market globally.

Governance: The United States attaches importance to its cooperation with resource countries and has signed a series of free trade agreements worldwide, such as the North American Free Trade Agreement (NAFTA) with Canada and Mexico, which helps to sustain the mineral resource supply of the United States. Furthermore, the United States tried to influence the transportation of global mineral resources through military and diplomatic strategies. The United States was also the first country to propose the establishment of the International Energy Association (IEA). All of these actions helped the United States in establishing and dominating global rules, thus influencing the behaviors of other powers worldwide.

Knowledge: Information and research institutions play an important role in the exploration and utilization of the global mineral resources of the United States. For example, the United States Geological Survey (USGS) collects information on global mineral resources, estimates investment environments in resource countries, and has a series of publications. The USGS also provides information services to transnational corporations and thus influences the development of the global mineral resource industry through information dissemination.

From the above analysis, we conclude that the United States has goals consistent with those of a “great power of mineral resources,” and its four levels of mineral industry bodies maintain a dominant position in the exploration and utilization of global mineral resources.

4.2 The case of China

Presently, China is in the middle and late stage of industrialization. In the next 15 years, China will still be actively engaged in urbanization and industrialization activities. The demand for mineral resources will remain high. The mineral resources industry is still an important pillar in economic development. It is a strategic choice for China to develop scientifically and transform its mode of economic development. Therefore, as a major producer of mineral resources, China needs to consider the sustainable development of the mineral resources industry. Additionally, the huge demand for mineral resources implies that China needs to develop and utilize global mineral resources, and the international relations and global challenges to utilizing these resources need to be solved through global governance. In summary, China initially has the goal of promoting sustainable development and global governance. Therefore, we can further analyze and summarize the international influence of China’s mineral resources industry based on the four levels of production, finance, governance and knowledge.

4.2.1 Production level

Since the year 2000, industrialization, motorization, and urbanization were simultaneously accelerated in China and resulted in a rapid growth of the mineral resource industry. The growth of demand for mineral resources in China has become an important driving force for a new round of global consumption, production, and trade of mineral resources. China is already a big consumer, producer, and trader of mineral resources. However, it lacks large multinational companies that have an impact on the global mineral resources industry. Moreover, due to the poor industrial management and market mechanism, the activity of the mineral resource industry in China is quite low. For example in 2015, the four largest steel enterprises in the United States, Japan, and South Korea all accounted for more than 70% of the market in the respective countries, while the four largest steel enterprises in China only accounted for 18.5% of the total crude steel production in the country (World Metals, 2016) [6]. Low industry concentration causes a series of problems, for example, China has been weakly positioned in the

international mineral market for a long time and has thus been non-influential. The international iron ore supply is controlled by three international giants namely, BHP Billiton, Rio Tinto, and Vale. Under the long-term cooperative pricing mechanism, China's iron and steel enterprises have created a situation of negotiated seller monopoly due to their disordered competition, making China a passive receiver of mineral prices. From 2003 to 2008, the price of imported iron ore in China increased 4.6 times, which significantly harmed the benefits of China's steel industry [7].

In summary, although China has a relatively complete mineral resource production system, which has a certain impact on the global mineral resources industry, the activity of the mineral resources industry is low. China particularly lacks large multinational groups dealing in mineral resources with solid industrial foundations and strong capital strength that integrates capital, technology, production, and trade. Therefore, China has a weak ability to balance the supply and demand of national mineral products, stabilize the market and operate global mineral resources, and has no pricing power in the international mineral resources market. It can be seen that there are many main participants in China's production level, but they do not have obvious advantages in the global production structure. The problem of being "big but not strong" is thus more prominent in China's mineral resources industry.

4.2.2 Finance level

The mineral resources industry needs a large amount of capital and a long period of return on investment. At present, a small number of large state-owned enterprises is still playing an important role in the mineral resources industry in China. They are able to develop and expand with the help of domestic and even foreign capital market financing; while most small- and medium-sized enterprises cannot be listed for financing, and still regard bank loans as their main financing channel. Due to the uncertainty of the mineral resources market, banks issue limited amounts of loans at high interest rates. The limited financing channels and high costs of financing restrict the growth of most mineral resources enterprises. The participation of Chinese financial institutions in overseas mineral resources investments is also minimal. Since China is the biggest buyer of iron ore, we compare the shareholders of the three international iron ore giants (Table 1).

The result shows that the largest shareholders of these corporations are mainly investment institutions from developed countries, such as the United Kingdom, the United States, France, and Japan. By holding shares of these corporations, developed countries have an advantage in securing their supply of iron ore and making profits in spot and futures markets. In comparison, the participation of China's investment institutions in overseas mineral resources investment is limited although China is the largest consumer of iron ores.

Furthermore, the futures markets in China are not mature enough to influence the international market. For instance, there are three copper futures exchanges with great influence on the world. These include the copper futures contracts traded on the London Metal Exchange (LME), the Chicago Mercantile Exchange (CME), and the Shanghai Futures Exchange (SHFE). Relevant research shows that LME futures market has the greatest impact on the spot market price, followed by SHFE and CME. This finding shows that the SHFE copper futures contract enhances the pricing power of China, which still has a big gap with the LME. For iron ores, the Dalian Commodity Exchange launched the first physical delivery iron ore futures in 2013, and it is expected to influence the price of iron ores in the future [8,9].

There are high risks and large capital requirements in the development and utilization of overseas mineral resources. Chinese financial institutions and mineral resources enterprises need to cooperate in the investment on overseas mineral resources. Chinese financial institutions need to improve their financial support and participation in the investment on mineral resources enterprises. In addition, the ability of China's mineral resources futures exchange to dominate the pricing of the global mineral resources market is not enough.

4.2.3 Governance level

Presently, the market and trade rules of international mineral resources are established and dominated by developed countries. These rules, to a great extent, reflect the interests of developed countries. However, they are not aligned to the interests of developing countries due to economic globalization and the rise of developing countries. Although China is a member in the World Trade Organization (WTO), it still cannot well adapt to the WTO rules. For example, in 2014, developed countries sued China by taking advantage of China's rare earth export management, which did not conform to the relevant provisions of the WTO. China lost in the lawsuit, and China was forced to cancel the rare earth export quota management system from January 2015; from May 2015, China formally cancelled the rare earth export tariff.

In addition, China’s participation in the formulation of rules and standards for the mineral resources industry is relatively small. At present, the international mining rules and standards are dominated by Australia, Canada, the United States, the United Kingdom, and other countries. Under the leadership of the mining associations of Canada, Australia, the United States, the United Kingdom, and other countries, international mining financing, mining rights trading, and other rules have been formulated. For example, the JORC Standard, which was formulated by the Joint Ore Reserves Committee (JORC) of Australia, is one of the most widely used and most influential open reporting standards for exploration results, mineral resources, and ore reserves in the world. The mining rights evaluation method, reserves calculation standards, and international mining accounting standards, which are mainly formulated by Canada, Australia, and other countries, have also become global common rules.

In summary, at the level of governance, China’s ability to formulate and maintain market rules, trade rules and industry rules and standards, is still far behind that of developed countries such as the United States.

Table 1. Shareholders of three major international iron ore manufacturers.

Corporation	Largest shareholders in 2015				
Rio Tinto Limited ^(a)	HSBC ^(b) Custody Nominees (Australia) Limited 21.96%	J.P. Morgan ^(c) Nominees Australia Limited 17.67%	National Nominees Ltd ^(d) 9.05%	Citicorp ^(e) Nominees Limited 4.96%	BNP Paribas ^(f) 2.44%
BHP Billiton Limited ^(g)	HSBC Australia Custody Nominees Pty Limited 18.97%	J.P. Morgan Nominees Australia Limited 13.77%	National Nominees Ltd 7.99%	Citicorp Nominees Pty Ltd 5.39%	BNP Paribas 1.96%
Vale S.A. ^(h)	Valepar ⁽ⁱ⁾ (53.9%)				BNDESPAR 6.5%
	Litel ParticipaÇões S.A. ^(j) 49%	Bradespar S.A. ^(k) 21.21%	Mitsui & Co., Ltd ^(l) 18.24%	BNDESPAR 11.51%	

Note: Data are from the 2015 annual reports of the three corporations. Some commentaries on the companies are as follows:

- (a) Rio Tinto Limited is a British-Australian multinational corporation and is one of the world’s largest metals and mining corporations.
- (b) HSBC Holdings PLC is a British-based multinational banking and financial services company headquartered in London, England.
- (c) J.P. Morgan & Co. was a commercial and investment banking institution based in the United States.
- (d) National Nominees Limited is an Australian public company.
- (e) Citigroup Inc. is an American multinational investment banking company.
- (f) BNP Paribas is a French multinational bank and financial services company with global headquarters in Paris, France.
- (g) BHP Billiton Limited is a British-Australian multinational company dealing in mining, metals, and petroleum, and is headquartered in Melbourne, Australia.
- (h) Vale SA is a Brazilian multinational corporation that deals in metals and mining and is one of the largest logistics operators in Brazil.
- (i) Valepar is the parent company of Vale.
- (j) Litel ParticipaÇões S.A. is a pension fund in Brazil.
- (k) Bradespar S.A. is a Brazilian holding company headquartered in São Paulo, Brazil.
- (l) Mitsui & Co., Ltd. is one of the largest general trading companies in Japan.

4.2.4 Knowledge level

Universities, scientific research institutions, and the media influence the thoughts and decisions of other subjects fundamentally through the dissemination of knowledge and information. At present, China has not established a global mineral resources information system, and still depends on foreign research institutions (such as USGS) to access information on global mineral resources. For the understanding of market price mechanisms, China also relies on western economic ideologies. According to the data of the essential science indicators (ESI) on geoscience academic research, the United States accounts for 31.5% of the number of papers in the field of Geosciences, while China accounts for 12.36%, which is close to the United States. However, in terms of the frequency of citations and the percentage of papers cited, the United Kingdom, the United States, Germany and France are significantly higher than the average levels, while developing countries such as China are rated lower

than the international average [10].

From the above analysis, China presently meets the goal of a “great power of mineral resources” at the production level. The main bodies at the production level have a strong foundation, but the corresponding strong transnational mineral resource enterprises are lacking. The other three main bodies have a weak impact on the development of the global mineral resource industry. Therefore, it is difficult for China to reach the standard of a “great power of mineral resources.” It needs to integrate four levels of bodies to further exert influence on the international mineral resources industry.

5 Conclusion and policy implication

Starting from the concept of “great power,” this paper systematically analyzes the connotation of “great power of mineral resources,” and compares the mineral resources industry of the United States with that of China. It is found that the “great power of mineral resources” is a country that can have a great impact on the global mineral resources industry, and its influence comes from the strength of the four levels of main bodies namely, production, finance, governance, and knowledge. The main implications for China to build a “great power mineral resources” are as follows:

In the current international context, China should give priority to the sustainable development of the domestic mineral resources industry and the efficient utilization of resources. China should also participate more actively in and influence global governance in the field of mineral resources. In the development and utilization of foreign mineral resources, we must strictly follow the principles of low carbon, economy, and green operations.

At the production level, China should give full play to the market mechanism, improve its industrial concentration by means of mergers and acquisitions and other means, and cultivate excellent enterprises into multinational companies with international competitiveness. These enterprises should lay out global mineral resources, and actively participate in the development and utilization of global mineral resources and market competition to enhance China’s operation capacity for global mineral resources.

At the finance level, the financial institutions in China must participate more in the investment on overseas mineral resources and improve their financing capacity for mineral enterprises. In addition, China should give full consideration to the advantage of scale in the domestic mineral resources market, and promote the internationalization of existing iron ore futures to become the iron ore pricing center. Meanwhile, China should use the futures market for price guidance and risk hedging by launching more financial instruments such as mineral resources futures to ensure price steadiness in the international mineral resources market.

At the governance level, first of all, China needs to use its growing international influence to promote the development of the existing global governance system toward the direction of self-benefit and benefits to developing countries. China should combine the mineral resources strategy with diplomatic strategy to strengthen friendly cooperation with resource countries around the world. As a newcomer, China needs to adapt to the complete system of current international mineral resources market rules, trade rules, and industry rules. China needs to join relevant international organizations and be more active in putting forward more proposals in line with their own interests. China should transform into the makers and maintainers of international market rules, trade rules, and mining rules and standards instead of being the recipients.

At the knowledge level, China must enhance the role of its think tanks. Particularly, it is essential to enhance the ability to disseminate information and knowledge on mineral resources on a global scale, accurately predict the supply and demand of mineral resources domestically and overseas and correctly judge the trends in price fluctuations. At the same time, China should strengthen academic research, technological progress, personnel training, and knowledge popularization in the field of geoscience.

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