

DEVELOPMENT, UTILIZATION AND PROTECTION OF HUNAN WELL AND ROCK SALT RESOURCE

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Abstract: Hunan well and rock salt resource is formed to two wide ranges in the natural environment which are the north part and the south part. They are Xiangheng salt rock and Xiangli salt rock, their natural distribution is extremely reasonable. Until now, it is clear that the area of rock salt mine is about 850 square kilometers. The principle of "rational exploitation, effective protection" is always insisted. We change the resources superiority to economic advantages, bring the foundational function of the salt industry into full play, improve and expand the salt industry production, transportation and sale system, actively advance the salty chemical industry campus suggestion, promote the utility ratio of the resources in large-scale salty chemical industries with high strength and advanced level, research and develop the processing technology of salt more deeply, develop glauber salt's derivative product and speed up the construction of circulated salt chemicals industry system, which is low investment, high yield, low energy consumption and high benefit.

Key word: Salt resource, Development, Protection

The special character of the salt's production, circulation and management control is that the salt is special commodity related to the national economy and the people's livelihood, which can not be replaced by and other materials. In 1967, the National Planning Commission of China authorized the investment of the construction of a salt mine, which designed capacity is annual yield of 300,000 tons, in Xiangbei Li district near Jinshi area in June, 1969. In December of the same year, Xiangheng salt mine was constructed in Hengyang tea mountain town Xiangnan. Both of them were completed and started the production in 1971. Henceforth, The using of salt in our province needs to rely on other

provinces to transport and the history of non-production of sally in our province finished.

Since the 90s, we have cooperated fully with the relative departments and successfully implemented the iodized salt project. The supplying network was established completely, the adjustment of salt industry structural and the supervision of the market were increased, the security and timely supplement of the qualified iodized salt were guaranteed, comprehensive enhancement of eliminating the iodine deficiency disease was ensured. Simultaneously, our province also strengthened the conservation and reasonable development of well and rock

salt resources, a lot of work was done and certain efficiency was obtained.

THE FUNDAMENTAL STATE OF THE DEVELOPMENT AND UTILIZATION OF WELL AND ROCK SALT RESOURCE IN HUNAN

General situation of salt industry resource

Hunan well and rock salt resource is formed to two wide ranges in the natural environment which are the north part and the south part. Their natural distribution is extremely reasonable. Until now, the verified salt mine area is approximately 850 square kilometers. It includes 47 square kilometers in Xiangbei region, around 7.2 square kilometers mining area in Xiangli salt rock is under mining with the mining license and the storage capacity is 123 million tons. According to present scale of production that annual yield of fine salt is 700,000 tons, mining returns-ratio is 30%, and salt-making returns-ratio is 90%, the mine can be mined for 48 years, Xiangnan region has 800 square kilometers mining area. 32 square kilometers among it is located in Hengyang tea mountain town and around 8.64 square kilometers mining area is under mining with the mining license. The storage capacity of rock salt is 809 million tons, which can be mined for 79 years base on the production scale of 2 million tons fine salt per year.

The storage capacity of well and rock salt resources in our province is quite large (occupies the third place in the country at present), which is easy to mine and high grade (the average grade of sodium chloride is 57.23-83.26%). The storage capacity of two main well and rock salt resources, the south part and the north part in Hunan, is around 13.4 billion tons, which is divided as 1 billion tons in Xiangli salt mine and 12.4 billion tons in Xiangheng salt mine.

The situation of the resource protection and reasonable development and utilization

During more than 30 year mining production process, the fundamental of "reasonable mining, effective protection" was always insisted on, scientific methods of mining were unceasingly researched and felt around, and reasonable measurements of well and rock salt protection were continuously explored.

Xiangli and Xiangheng salt mine carried on some experiments and recommended advanced technology separately, base on their own ore deposit's geological condition in 1970. Taking use of hydraulic fracturing method to mine rock salt was the first time to try on in domestic. This technology is an advanced salt mining method accepted by both domestic and abroad, it may also have particular directive significance on raising the mining rate. In 1980, Xiangli salt mine used the abandoned well from single well convection to recover and lengthen the life time of brine well by assisting fracturing method. It increased the mining rate enormously. In 1990, this mine took the lead to use electric submersible pump in domestic. It not only increased the mining rate but also solved geological environment problem. In 2005, this mine introduced the advanced technology of horizontally butted well to mine the ore resources where not convenience for the well pattern. Connection started from under the farmland and the private residence where not convenience for the well pattern, which played an important role in mining the resource which is located at inconvenient for well drilling, recycling ore pillar saved resource and reducing the compensation. Until now the mining rate has achieved 31.64%.

Since the 70s and the 80s, Xiangheng salt mine has put forward some new technologies for brine extraction, such as cracking method, oil underlay convicting, natural solution and communication through two wells and so on. The recovery efficiency of rock salt resource has reached 20%, which reaches the domestic advanced standard and developed a new way with high

quality, high production and low consumption for mining the multi-thin-layer ore deposit. This technology has already been applied and popularized in Yunan, Jiangsu, Hubei provinces, and has made the good effects. Since 2005, this ore has started to supervise the span of hydraulic mining cave, prevent the fall of ground and such kind of research works. According to take use of sonar measuring technique to measure the volume and shape of hydraulic mining cave profited from other domains, the maximum permission dissolution radius was determined through digital supervision and physical mechanics research discussion. It provided the exact ore pillar and reasonable well pattern to guarantee the development, utilization and protection of the rock salt.

The mining technology of Xiangli and Xiangheng won the second prize of the national light industry scientific and technological progress achievement, the first prize of Hunan province scientific and technological innovation and the patent of invention.

According to the Eleventh Five Plan of light industry salt industry in our province, the salty chemical industry must be developed vigorously, strengthen the resources by provincial government needs to be carried out. During the period of carrying out the Eleventh Five Plan, we will achieve the purpose of product and market of each kind of salt 2.6 million tons, the asset size and proceed of sale amount to 5 billion Yuan respectively.

OPEN QUESTION

In China, the well and rock salt resource is a kind of abound resource. The rock salt ore deposit with verified storage capacity of more than 10 billion tons is about 30. The resource in our province is very rich. Although we have made some efforts on the reasonable development, utilization and protection of the well and rock salt resources, but some problems are

still existed. They can be described from several aspects as the following:

The development order is not good enough.

Along with the continuous development of market economy, some individual places only thinking from the development of their own economic, they carry on investor and capital attracting to the development of salt industry resource without deeply consideration. In addition, the management in minority places is not strict enough and the method is not efficient. As a result, cpyoting and environment destruction of the peripheral area of two main well and rock salt resource region happens some time, which brings the bad influence for two national fixed-point salt-making enterprises production and operation. The first is building redundant project and wasting resources. Nowadays, there are 639 enterprises is producing salt, among them 98 are the national fixed-point production enterprise. In 2007, the national total output was 621.141 million tons, the total demand was 501.762 million tons, and the amount kept in stock was 142.874 million tons. In our province, in 2007, the total output was 1.4982 million tons, which occupied 2.4% of the national total output and also occupied 8.2% of the national well and rock salt total output 183.582 million tons. It played the fifth in sequence of the provinces that is mining the well and rock salt in the range of the whole country. In 2007, the salty sales volume in our province was 1.5283 million tons, among it only 459 thousand tons was the country direct plan (planed inside province was 316 thousand tons, outside province was 143 thousand tons), but there were still 1 million tons needed to sale in market. Because the national salt industries do not have a unified professional leadership and restrictive mechanism, so the salty output is always larger than the sell. The second is fighting for the resources and destructing environment. In recent years, peripheral area

of Xiangli salt mine built redundant project of two chemical plants and there three new factories were built near Xiangheng salt mine. These enterprises fight for the resources for the purpose of momentary interests. The method of exploitation and the process are not very reasonable. They put too much attention to the exploitation but less to the protection, much attention to economic efficiency less to security prevention. As a result, the submergence of ground was happened, the underground water was polluted, the vegetation was destructed and the resource was wasted, all of these caused disaffection from the local common people.

The development and utilization is unreasonable.

Firstly, the method of exploitation is backward, which causes the seriously waste of resources. Some enterprises use backward technical with obsolete equipment to carry on the simple well drilling and brine extraction. They only mine the area where is rich with resources and easy to mine. So the resources were wasted massively. The resources recovery ratio of Xiangli and Xiangheng rock salt mine is 20% higher than theirs. Secondly, low recycling and bad environmental protection. Through many years' research, Xiangli and Xiangheng salt mine developed some reasonable and scientific mining and recycling methods, after that both of their recovery rate of mining achieved 30%. Some enterprises do not have a long-term and scientific plan in the mining of salt resource, they build redundant project, waste resources and damage the environment.

Industrial advantage is less prominent

Salt industry system, management and benefit of our province are in the leading position among the same national industries. But the resources and industrial advantages are not prominent. The first point is, the resource development has not formed the advantage of scale. There are ten salt mines

and chemical enterprises is mining the two main well and rock salt resource in our province, but the size of scale of the resource development is quite small. In overseas, the annual output of one salt field is more than 10 million tons. The second point is, the industrial development has not formed group advantage. Salt as the basic chemical raw material can also be called "the mother of the chemical industry". As early as in the 1950s, salt, coal, petroleum, limestone and sulfur altogether named five key industrial raw materials in the world. There are more than 10 different kinds of chemical products in the salty group. At present, the salty chemical industry is small, dispersion and weak. The resources, technology, equipment, talented person, management and so on, such kind of production factors are not effectively conformity. The advantages of industrial cluster and enterprises accrete into enterprises groups are not obvious. The third point is, The market share has not formed the competitive advantage. The chemical enterprises in our province need nearly one million tons salt every year, but Xiangli and Xiangheng ore only occupy 35% of the chemical industry salt dosage inside the province. The chain of salty industrial is short and technical added value is low, so it is lack of the core competitiveness in both domestic and foreign markets.

RECOMMENDATION AND COUNTERMEASURE

The Central Party Committee proposed that Insist on saving resources and protecting environment function as the breakthrough point, positively promote the industrial structure optimization, wash out backwardness productive forces and let human, economy and environment develop in harmony are requested. In addition, they also proposed that the development and protection of rock salt resource in our province need to be enhanced; the resources

advantages have to change into economic advantages; the foundational function of salt industry have to be fully brought into play; the production of salt industry and the transportation and sale system need to be improved and expanded; the development direction of salt chemical industry have to be leaded to low production cost, high product added value, high resources utilization ration, high labor productivity and high comprehensive benefit.

Strict the access procedure to salt industry market

The national salt industry law and "Hunan Province Salt industry regulations on administration" has stipulated explicitly that: Food salt monopoly, all the demanding for salt need to be supplied through the local salt industry company, except for soda industry. All the governments must manage the production and business of salt industry strictly base on the national law and our province regulation. In the other word, non of the government can give the permission to any project by themselves.

Strengthen the management and supervision mechanism to the salt industry market

The salt administration in our province has established a long stable and effective salt industry market supervisory mechanism co-operating with department of public security of province and administration for industry & commerce. Each department performs its own function and cooperates with others. A remarkable result is received. Recently, 13 national ministries and commissions have signed "Action plan of Eliminate Iodine deficiency Sickness realizing in 2010" together. Start from strengthen of the government responsibility to ensure the realization of the goal etc. According to such kind of seven aspects, the work responsibility and the duty of the government various departments is further specified. In order to further consolidate the achievement of eliminating the iodine

deficiency sickness and perform the duty of different departments, Perfection and strengthen this supervisory mechanism is suggested. The improvement and management of salt industry market is mainly carried on by the salt industry administration section, and supporting by the government, additionally, coordinate with various departments is also very important. Maintain the steady market of salt industry in our province together to ensure that people can eat relieved and qualified iodized salt.

Make overall plans for the development and protection of well and rock salt resource in our province

In "Government work report" premier Wen Jiabao pointed out that, the sally port and most important thing of the transformation to economic growth way is increasing the working dynamics in the aspects of save the energy, lower the consumption, protect the environment and save the intensive land. The fundamental realities of China is large population with less land, the quantity per capita of many important resources is much lower than the world average level and the bearing capacity of ecological environment is also very limited. The total quantity of well and rock salt resources in our province is rich, which occupies a large proportion of the national's. As a interior province, in order to sustainable develop the national economy, the development and protection of alt industry resource must be carried out as a long-term strategic mission.

Firstly, forbid disorderly mining and developing. The law and regulation stipulated by the country is that the approving authority of salt resource development is the salt administration in province. But nowadays, many approving of salt resource development and the phenomenon of disorderly mining is existing in our province

Secondly, reasonably use the salt industry resource and promote the

coordinated development of salt industry. Pay equal attention to both of the development and protection to ensure the sustainable use of the salt industry resource. New technology is encouraged to use, change the resources advantage to the economic advantage and the provincial government is suggested to strictly controlling the approval of mining and developing the well and rock salt resource located in our province, which is permitted by city government office and some relative departments.

Thirdly, the development salt industry should advocate that develop sea salt production, protect lake salt development and limit well and rock salt mining. Enhance the sense of hardship and crisis feeling, with the responsible manner for the country, the nationality and the posterity. Coordinate the relationship between the development of economic society and the population, environment and resource, to leave space for the survival and development for posterity.

Fourthly, strengthen the supervision and protection to salty resources. The total quantity of mineral resource in our country is large, and the mine type is quite complete, but the average amount per capita are few, the average amount per capita of 45 kinds of main mineral resources (petroleum, natural gas, rich iron ore and so on) is less than half of the world average level. Therefore, optimal land utilization and protect the mineral resource and environment are the most important thing. We have formulated "the salt resources protection means" together with department of land and resources of Hunan province. "The means" had pointed out explicitly that besides the solely state-owned corporation or state holding enterprise, other enterprises and individual can not develop the salty resources. In addition, the reasonable classification was made for the key salt resource areas, thus the phenomenon of coyoting has been controlled effectively.

Fifthly, widely mobilize the community to participate the protection of salt industry resources, and enhance the consciousness of reasonable development, utilization and protection.

Speed up the construction of salt industry production system which will save energy and protect environment

Recently, The Ministry of Land and Resources P.R.C proposed that the mineral resource have to be further conformed from five aspects, such as the reasonable mine exploitation arrangement, the improvement of mine ecological environment and so on. Integrating theory with our province's practice, the construction of salt industry production system which will save energy and protect environment is very important to develop and protect the salt industry resource.

The first point is conforming the standard and developing in order. The development of salt industry resource and the protection of environmental need synchronization plan, and carry out simultaneously. The enterprises that destroy the environment, cause serious pollution and do not have the safety in production and environmental protection qualification must be closed. The enterprises that do not have a reasonable arrangement for mining, method of exploitation and technical equipments, the scale of production can not achieve the lowest standard and exist significant security hidden danger must be rectified and improved within a specified time. Establish various kinds of rules and regulations and improve the management of mineral resource. Divide the mine area into prohibition and control area. Strictly control the mining in control area. The enterprises are asked to carry out the standard mining in minable area to optimize the development of the salt resource.

The second point is rational distribution to be strong industry. Through the optimize allocation of resources and enhance the resources concentration degree to be the

strong industry. Firstly, further complete the market allocation resources' mechanism. Promote the resource concentrating to strong and advance big enterprise. Insist on the principle: "big group constructs big base, big group matches with big resource". Secondly, study the "The Law of Property", control and take use of Mammon. "The Law of Property" plays an important role in reform and opening-up and social life. The "property" in the law refers to the substance which can be controlled and used by human, such as land, forest, mineral resource, vehicle, house and so on. Study "The Law of Property" may control and use the Mammon reasonable and protect the environment effectively. Thirdly, actively push forward the salty chemical industry park construction. Center on the salty chemical industry and related industries, widely seek for the new cooperation partners inside and outside the province and develop industrial agglomeration. There is a development tendency to the salty chemical industry park. On one hand, the inner request of the industrial park have be followed, the blind gathering should avoid. On the other hand, the localization of the industrial park must

be clear and the admittance mechanism should be strict.

The third point is base on the creation and scientific development. Insist on the depends upon the advance in technology, adopt new methods and new process to improve the production of well and rock salt. Increase the recovery ratio of resource to achieve the purpose of protection resource. Transform the process of salt-making to raise the single effect output, the final purpose is to achieve high quality, high production and low consumption. There is a need for the development of salty sub-production to enhance the rate of multipurpose utilization. Research and develop the advanced process technology for salt, develop Glauber salt derived product and form a certain production scale. Base on the innovation, speed up the construction of recycled salt chemicals industry system which is low investment, high output, low energy consumption and high benefit. In addition, speed up the new type of salt chemical development with resource conservation, environment friendly, economic cycle and scientific management.