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Review Article

Knowledge of Salt Mines in the World

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Abstract

The cities located in the central part of Iran generally have dry weather, and according to their climate, you can search for the best salt mines of Iran in these cities. From the central part to the south of the Iranian plateau, Semnan, Qom and Fars can be mentioned as cities with salt mines.

In the meantime, Semnan province has become Iran's salt pole and Iran's largest salt mine due to its climatic conditions and geological structure, and the best salt mine of Iran can be found in this province, especially Garmsar city.

In this article, we have collected information about the largest salt mines in Iran, stay with us. Rock salt, which is also known as halite today, is a mineral in nature that consists of sodium chloride, whose chemical symbol is NACL. Salts from different parts of a country, including seas, lakes formed with salt water.

Salt consumption has been popular in Iran since 6000BC. But regarding the extraction and processing of salt, a review of the history of buying and selling salt in Iran shows that the exploitation of Iran's salt mines goes back to more than 2000 years before Christ and the Achaemenid era. This long history is due to the presence of rich salt reservoirs in Iran.

Keywords: Mine, Salt, Soil

Introduction

While salt is commonplace today, it used to be hard to come by and considered a delicacy, as well as a mark of wealth. Before the Industrial Revolution, salt mining was incredibly dangerous and was done largely by hand. Rapid dehydration in miners from constant contact with salt and the "salt dust" that was breathed in made life expectancy short. As such, this was the work of slaves and prisoners. The difficulty of mining made salt a rare symbol of wealth on a table.

Now, however, salt is a kitchen staple. Because of the efficiency of mining, salt is much more commonplace and affordable. Here are the top 10 largest salt mines in the world (Figure 1).

Figure 1: Largest salt mines.

Cathedral of Salt in Colombia

The Cathedral of Salt in Colombia is the largest salt mine in the country. It is carved out of the Zipaquira salt mines which have been in use since the 5th century BCE. The Cathedral was carved out of an active salt mine in 1950 after being inspired by a small cathedral erected in the mines by workers. The original cathedral was inaugurated in 1954. However, authorities shut down the working cathedral in 1990 after concerns were raised about structural soundness in an active mine. However, the local town was undeterred and began building another cathedral 200 feet below the previous one, completing it in 1995.

The current cathedral is 75meters long, 25meters high and has a giant cross carved on the back wall. Approximately 10,000 people can be fit into the cathedral at capacity, and it attracts 3,000 plus visitors on most Sundays.

Asse Salt Mine in Germany

The Asse Salt Mine has been at the forefront of much controversy in the past decade. It was once a set of mines where both potassium and rock salt were excavated from 1906-1965. After the site closed, the state took it over to test the concept of storing radioactive waste.

From 1967 to 1978 approximately 125,000barrels of low-level and medium-level radioactive waste were stored in the mines. However, in 2008 some media reports disclosed that contaminated brine had been pumped deep into the lowest part of the mine caverns. This was because the groundwater of the region was breaching the caverns, raising the possibility of corroding the barrels with rust and causing leakage into the water. This was especially concerning if the mine flooded.

Furthermore, the mountain itself isn't that stable which is causing the cracks that are causing the flooding. There is a worry that the caverns will collapse completely. In 2010, it was decided to remove the barrels, which could take years. However, there is a risk to local residents from exposure that may make it more feasible to leave the barrels down there. Regardless, you can tour this radioactive salt mine when you visit Germany (Figures 2,3).

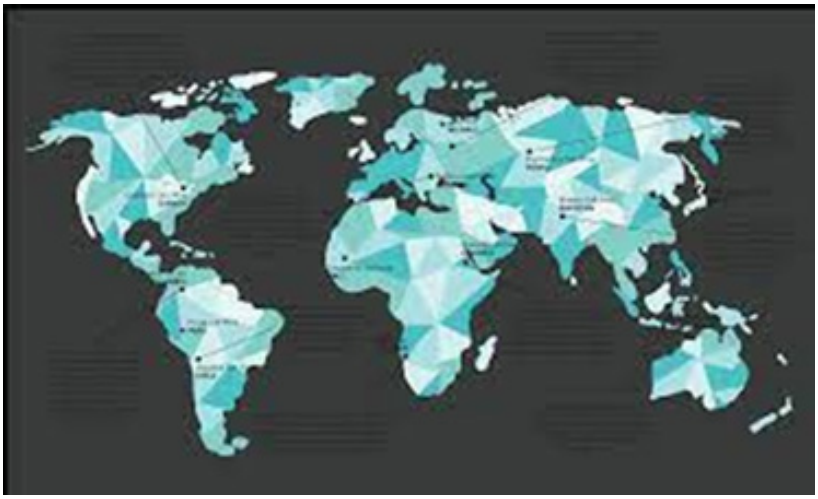

Figure 2: Show different point of mine in world.

Figure 3: Show satelit mine salts and minerals.

Maras Salt Mine in Peru

These Peruvian salt terraces were once a precious asset of the Inca. An underground spring that feeds on waters of the mountain range carries heavy silts and salts which collects in the cliffside ponds. The salt is then harvested by native people. Access to the ponds is incredibly difficult, as workers much traverse the Urubamba valley. The crevasses are enough to make all but the most adventurous of travelers turn back.

The rich pink salt produced from this Peruvian valley once supplied ancient Incan capitals, and the channels used to inundate the terraces that were built by the Inca are still used.

Danakil Salt Pan in Ethiopia

The Danakil Salt Pan is one of the most famed salt pans in the world, because of its reality-defying climate. The salt pan is nicknamed "The Gateway to Hell" because it is considered the hottest inhabitable place on the planet. Because parts of the Danakil are under 300feet under sea level, forming a volcano-rimmed cauldron which reaches below 120degrees in the summer.

However, the Afar people still venture into the cauldron early in the morning, when it is just 50-60degrees Celsius to extract blocks of salt from the 800mm thick layer. The salt blocks were once used as a unit of money in Ethiopia and are now sold across the country. They often supply farmers who use them to give livestock necessary minerals (Figure 4).

Figure 4: Largest salt mines and extraction.

Palibelo Village in Indonesia

The Bima Salt Pans on the island of Sumbawa play a huge art in one of Indonesia's most important commodities. The salt pans of Bima Bay occupy nearly 7square miles and have been producing salt for centuries. The salt from Bima has been traded throughout the Indonesian archipelago for centuries. It is also believed that Bima salt made it to Malaysia and the Philippines along the travels of Bugis sea gypsies. Though today Bima salt is one of the island's most important commodities, the production is still largely a cottage industry. This is because salt pans are farmed by hand via individual families or even small cooperatives.

Wieliczka Salt Mine in Poland

The Wieliczka Salt Mine in Poland is a World Heritage Site and a National Landmark in Poland. It no longer serves as an industrial mine and instead operates mainly as a tourist attraction. The deep grey salt deposits formed in the Miocene Era, or about 13.6million years ago. The first mention of salt in Wieliczka was in the 12 centuries when a Benedictine Monastery was granted rights to salt from the mine. The mine was in operation from the 13th century, until 1996, when the formal industry was shut down. It even survived occupation by the Germans from 1939 to 1944.

The mine is known for its chapel, the Chapel of the Holy Cross in the Franz Joseph I Chamber. It was built in 1871 as an offering for the years-long fight against flooding in the lower levels caused by catastrophic magnesium potassium mining. The mine also features a Crystal Grotto in the lower levels and historic saline baths that make it a huge tourist destination (Figure 5).

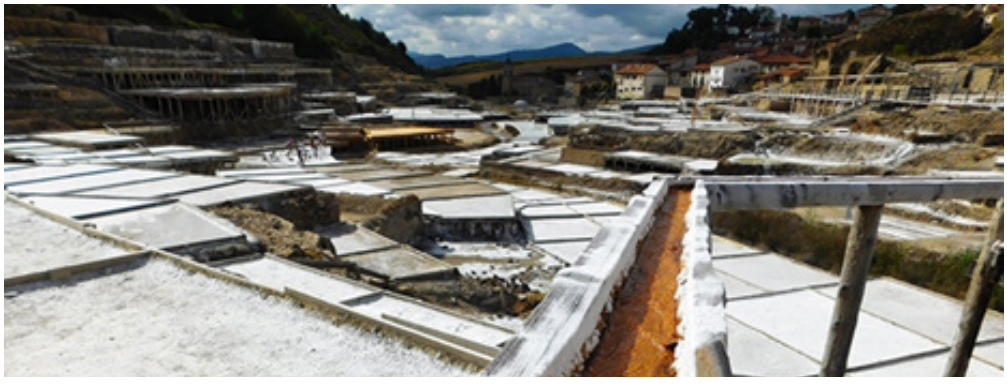

Figure 5: Largest salt mines and extraction mineral.

Atacama Salt Flat in Chile

The Salar de Atacama, or Atacama Salt Flat is the largest salt flat in Chile. It is surrounded by mountains and volcanoes with no drainage source. Although the Atacama Salt Flat is the largest in Chile, its output is a derivative of the salt present: lithium.

Lithium and boron are both extracted from the Salt Flat brine in the form of ulexite and double or triple salts of lithium sulfate. This occurs in the southern region of the salt flat. The Atacama Salt Flat is the world's largest and purest active source of lithium, containing 2017% of the world's lithium reserve base. As of 2017, it produced about 36% of the world's lithium carbonate supply [1-6].

Prahova Salt Mine in Romania

The Prahova Salt Mine has the distinction of being the largest salt mine in Europe. It is no longer used for industrial purposes but has a far more interesting one now. That is for healing and medical excursions.

It is laid out for the public in 14breath-taking galleries, pun intended. Visits to the salt mine are recommended to treat some respiratory infections, after all! In these galleries, you can see motifs, sculptures, and busts carved of salt, including a bust of Decebal the last King of the Dacians. These were the ancestors of the Romanian people. The galleries are over 55meters high, which is taller than the height of the Statue of Liberty (without the foundation.) (Figure 6).

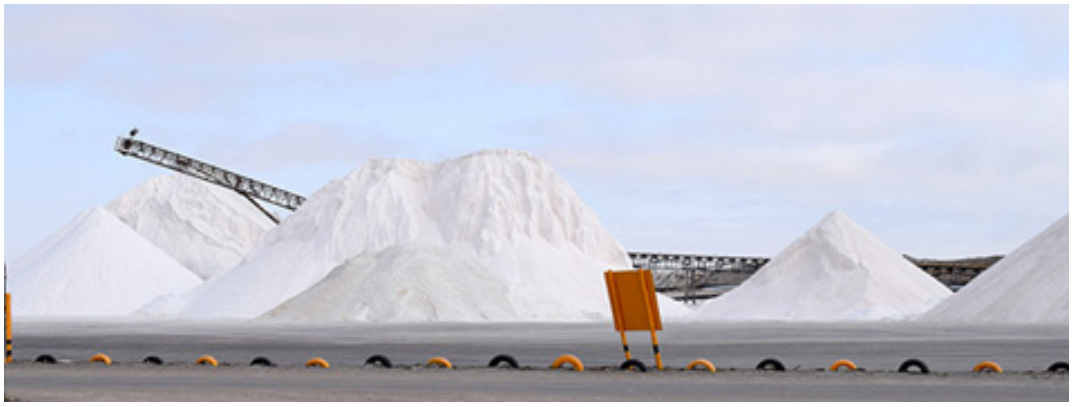

Figure 6: One largest salt mine.

Khewra Salt Mines in Pakistan

The Khewra Salt Mines were said to have been discovered by Alexander the Great in 326 BC. Well, that's not exactly correct. The true credit for discovering the salt in Khewra goes to his horse. This is because when his army stopped to rest in Khewra, Alexander's horse and the horses of his soldiers began licking the stones on the ground. A brave soldier tried it himself and discovered the salty flavor.

Today, the Khewra salt mines are the second largest in the world. They turn out 325,000 tons of salt a year. The output over its lifetime is estimated to be 220million tons. Amazingly, this isn't even a dent into the salt that's stored here, which is estimated to be about 6.687billion tons. The mine is 748 feet deep with 11 stories, the mine is filled with tunnels that run nearly half a mile into the mountain. Only 50% of what is mined is taken out, the other 50% is used as support columns in the enormous mine.

Sifto Salt Mines in Ontario

This Canadian salt mine holds the distinction of being the largest salt mine in the world. It is located 1800 feet under Lake Huron. For perspective, that's just 15feet shorter than the CN Tower in Toronto! The salt was once deposited 400million years ago by an ocean that covered the Great Lakes Basin.

The mine has been in operation since 1959. The biggest purpose for this salt is a lifesaving one. The rock salt produced from the mine is sold to retailers all over North America to spread in the winter snow and ice. This helps prevent black ice which causes many wintry accidents and fatalities. Salt is also sold to make industrial and cleaning products.

Amazingly, there is a very unusual little town below the lakebed in the enormous mine. Approximately 400 people work in the subterranean city, and it features roadways that enormous 40-ton dump trucks drive on. The dump trucks are stripped to their frames, lowered into the mine and reassembled, never to come to the surface again. The maze of service depots, lunchrooms, storage caverns, workshops and plants below the lake used to have a bus system until the 100miles of roadways got too complicated. Now the workers employ a fleet of John Deere Gators to get to and from their destinations.

Acknowledgments

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Conflict of Interest

No conflict of interest.

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