Smart strategies for the transition in coal intensive regions

Project No: 836819

Factsheet:

Green ideas for creative leisure time of Rio Tinto Mining Park, Huelva, Spain

SEPTEMBER 2019

Description

Rio Tinto (Red River) area of Huelva province boasts 3,000 years of mining history, from the Phoenicians then Romans, right up to the 1990's[1].

The "Parque Minero Riotinto" (Rio Tinto Mining Park) offers enough activities for a whole day out. You can visit[1]:

- Mining and railways museum, with its detailed history of mining in Rio Tinto, Roman mine reconstruction, Maharajah's railway carriage and steam engine;
- Peña del Hierro open-cast mine, where you enter an actual mining gallery;
- Bella Vista, the English barrio, complete with social club, Presbyterian Church, and village green. Casa 21 is a restored Victorian engineers house;
- Train trip in an original wooden carriage along the banks for the red Rio Tinto, to see the old mines and machinery, as well as the extraordinary landscapes.

Additionally, if you have an interest in history, geology, chemistry, metallurgy and/or engineering, then you'll find it highly rewarding. But even if you don't fall into any of these categories, Rio Tinto Mining Park still offers an enjoyable and educational experience for all ages[1].

1. **Location:** Minas de Riotinto municipality, province of Huelva, Autonomous Community of Andalusia, Spain
2. **Type of action:** Conversion of a mining site into a leisure facility
3. **Actors:** EMED Tartessus (a Spanish company owned by the multinational EMED Mining)
4. **Financing conditions:** Private investment
5. **Fund(s):** N/A

Minas de Riotinto (Rio Tinto) is a town named after the river which flows close to it, which is coloured red (tinto, as in vino tinto) due to all the mineral ores, such as iron and copper, in its waters. It is located 65 km north-west of Seville, in the 230 km-Iberian Pyrite Belt, which extends as far as the Atlantic coast of Portugal[1].

Arising out of the midst of the surrounding greenery, the giant opencast mines of Rio Tinto create a surreal, almost lunar landscape. The removal of layer upon layer of soil and rock, in the search for iron ore, copper, silver and a host of other mineral ores, has tinted this part of the world in hues of dusty pink, brown, yellow, red and grey. So great is the scale of operations, that the depression created resembles a man-made crater that measures several kilometres across. From the edge of the "crater", a giant space opens up before you[2].

Walls of terraced rock, streaked with the unusual colours of mineral ores create the impression of a natural amphitheatre of gargantuan proportions that could easily be mistaken for the set of a Star Wars movie[2].

Rio Tinto is, however, more than an isolated cavity on the earth's surface. Its growth has consumed not only mountains and valleys but even entire villages, whose populations had to be resettled in specially built towns nearby. Named after the river which flows through the region, itself named for the reddish streaks that colour its water, Rio Tinto has become a landscape within a landscape. The unearthed minerals give the soil and waters of the region odd, otherworldly shades of blue, green, yellow, red and brown, so it is not unusual to see bright orange or green rivulets trickling past. The predominant ores, however, are the ferrous ones, which oxidise when they come into contact with the air and colour land and river alike in shades of reddish brown. Even as far as Niebla, roughly 50 kilometres to the south-east, the waters of the Rio Tinto still flow past the town's ancient fortified walls in an eerie trickle of blood-red[2].

Close to the town itself are a number of large open cast mines spread over a wide area - Corte Atalaya is perhaps the most impressive as it is the largest open-pit mine in Europe[3,4]. Elliptical in shape, 1,200 metres long, 900 meters wide and 350 metres deep, it was begun in

1907 and closed in 1992. Since 1994 it has been flooded up to the 16th ring. Cerro Colorado is another mine of note. Peña del Hierro can be visited, Cortalago is an old Roman mine. The "Parque Minero Riotinto" (Rio Tinto Mining Park) was set up in 1992, so that visitors can learn about the important history of these mines[1].

Figure 1: Homage to the Rio Tinto miners

(source: http://www.andalucia.com/province/huelva/minas-de-rio-tinto/home.htm)

Achievements

Rio Tinto mining and railway museum

Housed in the former British hospital, the museum displays models, documents, rock samples, artefacts and actual machinery, tracing the long history of the Rio Tinto mines[5].

You can read information about the area's geological make-up, and see fragments of the various ore-rich rocks, such as the vivid blue chalcanthite (use to make copper), and the multicoloured iridescent goethite, known locally as golsan - golden sand, used as an iron ore[5].

Various scale models show the development of Rio Tinto (both the mines and the town) between 1892 and 1992.

Local human settlements dating from the Copper, Bronze and Iron Ages are well explained and documented, with information about, and examples of, their corresponding metallurgical processes with a recreation of a 3rd century BC dolmen (burial mound), complete with bones. From the Roman period, you can see jewellery, coins, sarcophagi and beautiful pieces of glassware, as well as another tomb[5].

One of the highlights of the museum is the reconstruction of a Roman mine. The water-wheels (the original was found in nearby Cortalago mine) with their human operators, designed to drain water from the mines, are a testament to the impressive engineering skills of the Romans, as are the hydraulic screws[5].

There is a restored steam engine and information about the extensive collection of rolling stock the company once maintained. The other not-to-be-missed attraction is the Maharajah's carriage. This luxurious wood and leather coach was built in Birmingham in 1892 for a visit to India by Queen Victoria, but her trip was cancelled. It was sold to the mines and used for a visit by King Alfonso XIII in 1895[5].

Those interested in colonial life, and the social aspect of the mining community, should look out for black and white photographs (rooms 8 and 9) of various activities of the British inhabitants of Bella Vista. Old telephones and telegraph machines, weighing scales, miners' helmets and lamps; handwritten notebooks with accident statistics (working days lost, cost in pesetas, fatal/serious/light injury); photos of the company stores (workers were paid partly in food coupons), the embroidery workshop, which produced renowned items under the label

"Alto de la Mesa", beach houses at Punta Umbria (some of which still remain), and various sporting events (tennis, polo, cricket, football), all captioned in English. Small, personal details such as these bring to life the British era of the mines.

There is a shop selling samples of many types of quartz seen in the museum, as well as a restaurant.

Peña del Hierro mine

This mine is open to visitors. It is 10 km from Minas de Rio Tinto. It consists of a 200-metre tunnel (mining gallery) called Santa Maria, which you walk along (wearing a hard hat, provided). You can see shafts and galleries where the ores were extracted, an emergency exit in case the lift wasn't working, and chimneys where the steam from the locomotives used to transport minerals escaped. The ceiling is reinforced by beams of eucalyptus and pine[6].

The tunnel comes out on a balcony overlooking a small lake. The 25 m-deep lake is, in fact, the crater of the mine, created by the Romans. Along the walls of the crater you can see layers of various colours - yellow, gold, white, grey - where the different mineral ores can be found - mainly used in the production of copper, but also silver and gold[6].

You can also see the remains of equipment and buildings used to wash, sort and process the minerals mined here, most recently to produce copper, sulphur, iron and lead, before they were loaded onto trains and sent either Huelva, to be exported by ship. The wooden lifts used to extract the minerals are 125 metres deep - the vertical mine was divided into 12 levels. Don't touch the pretty, clear stream of water which flows near the entrance to the mining gallery, as this water is highly acidic and will burn[6].

Barrio Bella Vista and Casa 21

Casa Number 21 is a three-storey villa built in 1885, that was carefully restored in 2013 to show how a British family would have lived in late-Victorian Andalucia, complete with furniture, toys, jars of food and other domestic accoutrements. Its owner was a middle-ranking engineer, and his children, who lived there, helped advise on its decoration for the period restoration[7].

The first floor shows the master bedroom, a second bedroom is an office with mining company pictures, the third room is the child's and play room and features period sports equipment and photos on the walls.

One noteworthy aspect of the houses in Bella Vista, which differentiates the Barrio Ingles from the rest of Rio Tinto town, is the lack of security - all Spanish houses have fences or walls, and bars on the windows. Those in Bella Vista, however, have open lawns and flower beds, and while a few have doors or windows with bars, most don't - a pleasant reminder of times gone by[7].

The Presbyterian Church, a small, pretty neo-Gothic building of stone and brick, was recently restored. When Rio Tinto Mining was sold (nationalised) to a Spanish group in 1954, it was the only non-Catholic church maintained by a Spanish company in the whole of (deeply Catholic) Spain[7].

The Barrio of Bella Vista is now a living community with all the houses owned by private individuals. House Number 21 was purchased by the mining museum so that it could be restored and visited. You can actually stay in the special Bella Vista, there is a B&B called Victoria House and a house with rooms to rent called Old English House[7].

Mining railway ride

The train itself is part of the experience - you travel in the original, bright yellow carriages, some open and some closed, with wooden floors and benches, whose backs tilt forward or back, so you don't have to move seats when the train changes direction to come back again. It is a bumpy ride; this is the real thing, as these carriages were used to transport workers from Huelva to work in the mines decades ago. In those days, there were 143 engines in use, all but six British-made between 1874 and 1954[8].

On the first Sunday of the month between November and April**,** your carriage will be pulled by an original steam locomotive dating from 1875 - the oldest working steam engine in Spain. On these times the train only goes 11 km[8].

There's plenty to see - old locomotives and trucks, washing factories, storage tanks, pulleys and lifts, and various other equipment and machinery. The lunar landscape itself is extraordinary - mostly bare of vegetation, with reddish, golden, brown rounded mounds and peaks, craters, escarpments and ledges, set against an azure-blue sky, with green sulphurous pools[8].

Challenges

NASA's Astrobiological Institute is carrying out research, jointly with Madrid University, into the area's microbial life. The bare moonscape of the zone is very similar to that of Mars, both having conditions extremely inhospitable for living beings. While Rio Tinto is a "dead river" due to the lack of flora and fauna - plants, fish or frogs wouldn't survive the acidity of the water (pH 2.2) - it does have micro-organisms which are able to prosper, many of which were previously unknown life forms. So the project, known formally as MARTE (Mars Astrobiology Research and Technology Experiment), uses samples taken from the area to find clues as to how life evolved and developed in other part of the universe, including Mars[6].

An important challenge is to solve the problem of acid drainage that affects the whole area. Although, as shown above, acidic waters are subject to a study of the microorganisms that populate them, the area of investigation can be restricted, and the remaining acidic waters should be properly collected and treated to reduce their impact on the environment.

Another challenge is related to the operation of Rio Tinto Mining Park in a mining region that has become active again.

EMED Tartessus (a Spanish company owned by the multinational EMED Mining) is restabilising mining activity in Riotinto. In 2014 preparatory works began with earth moving machinery operating again. On the 17th April 2015 the earth shook in Rio Tinto for the first time in 14 years as the company used 6.500 tonne of explosive to remove 28.000 tonne of sterile rock[2].

Enabling conditions

Maintaining the Rio Tinto Mining Park site in operation is done with funds allocated by EMED Tartessus, and the amounts collected from visitors and donations or sponsorships.

However, if the problem of acidic waters will be approached in the future, EU funds may be available.

References and further links

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 836819. The sole responsibility for the content of this report lies with the authors.