



Mina subterrânea da Mineração Serra Grande

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## Despite having one of Brazil's most productive gold mines, Crixás' (GO) Human Development Index (HDI) remains low

### DATE

20/07/2012

### DISTRICT

GO - Crixás

### LATITUDE

-

### LONGITUDE

-

### SUMMARY

*Crixás, in Goiás, is home to one of the country's most productive gold mines. Despite the strength of the mine, the municipality - which has more than 15,000 inhabitants - ranks among those having the worst human development index, with outcomes much lower than the averages in the state and in Brazil.*

was approximately 5.2 tons of gold, and the monthly revenue was estimated at R\$ 27 million (FERNANDES; LIMA; TEIXEIRA, 2007; FERNANDES; LIMA; TEIXEIRA, 2011).



Site da Prefeitura

Prefeitura Municipal

## CASE DESCRIPTION

The beginning of mining in Goiás dates back to the early decades of the eighteenth century, when a pioneer expedition led by Bartolomeu Bueno da Silva discovered auriferous streams in the sertão (a semi-arid region) of Goiás (FERNANDES; LIMA, TEIXEIRA, 2007). Since then, the city of Crixás, with 4,661,158 km<sup>2</sup> and 15,762 inhabitants (IBGE, 2010), has seen several cycles of gold extraction, between miners' and mining companies' activities, and has demonstrated a strong dependence on the metal as in the region there is no other economic activity of medium or large size, only extensive livestock (TEIXEIRA; FERNANDES; LIMA, 2007; FERNANDES; LIMA; TEIXEIRA, 2011).

In 1989, Serra Grande Mining began operations in the Great Gold Mine of Crixás. The company is a joint venture between two of the most powerful mining groups in the world: the South African group AngloGold Ashanti and the Canadian group Kinross Gold, being administered by the first (ANGLOGOLD ASHANTI BRASIL, 2011).

The Great Gold Mine is divided into four mining fronts, of which three are underground. Altogether, Serra Grande Mining occupies an area of 210 km<sup>2</sup> and employs about 1,200 workers (FERREIRA, 2009). In 2006, only 43% of the employees were from Crixás. The average annual production

Until 2006, over 81 tons of gold had already been extracted from the site. Kinross shareholders claim that the mine is one of the most profitable in the world, for it has very low production costs compared with others (KINROSS, 2003). According to calculations by the National Department of Mineral Research (DNPM), the mine is reaching its limits and must be exhausted by 2015 (FERNANDES; LIMA, TEIXEIRA, 2007; FERNANDES; LIMA, TEIXEIRA, 2011).

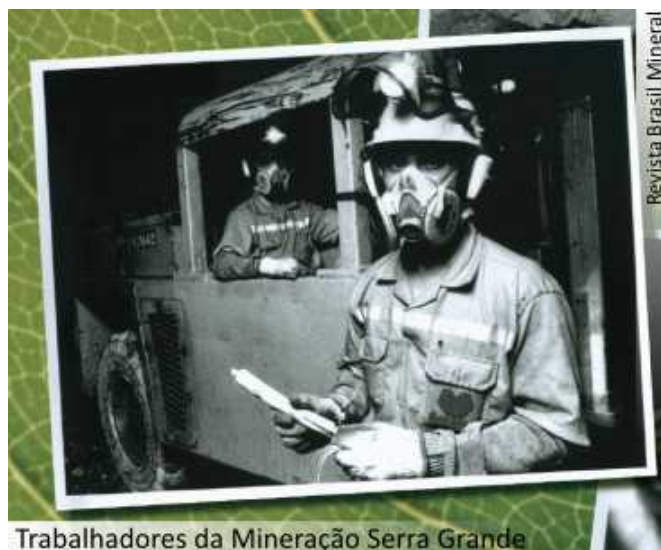
Gold in Crixás is present in the ore associated with arsenopyrite (FeAsS), an arsenic sulfide mineral. Similar geological features occur, for example, in the Iron Quadrangle, in Morro do Ouro, in Paracatu, Minas Gerais, and at Fazenda Brasileiro, in Bahia (DESCAMPS; MATSCHULLAT, 2007).

In 2002, the Public Prosecutor's Office (MP) of Goiás reported the existence of a number of illegal mining sites that might be contributing to mercury contamination in the region (MP-GO,

2002). The mines had been embargoed by the Brazilian Institute of Environment and Renewable Natural Resources (IBAMA) and the Environment Office until they were regularized by the competent environmental agency (AZEVEDO; DELGADO, 2002). The activity was banned in 1990 and, according to local reports, it gathered more than five thousand people (FERNANDES; LIMA; TEIXEIRA, 2007; FERNANDES; LIMA; TEIXEIRA, 2011).

In 2004, the Public Prosecutor's Office filed a civil suit against Serra Grande Mining. The company had been fined years before by the Public Prosecutor's Office due to the break of its tailings dam in the 1990s. The accident led to the eviction of millions of cubic liters of contaminated water into the Vermelho River, in Crixás. The report made by the Prosecutor's Office and sent to the judge in the case stated: "confirmed through various analyzes and attached to this (report), it is clear therefore that the disposal of the mentioned chemical waste - mainly cyanide and arsenic - did not meet the recommended levels, unequivocally demonstrating the existence of very serious water pollution and law violation" (ANDRADE; LEONE JR., 2006).

In 2007, a study carried out by researchers at the Center for Mineral Technology (CETEM) compared a battery of Human Development Index (HDI) tests from the population of Crixás, measured within the years 1991 and 2000. The objective of the study was to determine whether mining had brought real benefits to the local people. Issues on environmental responsibility, sustainable development as well as the interrelations between the large mine and local community were analyzed (FERNANDES; LIMA; TEIXEIRA, 2007; FERNANDES; LIMA; TEIXEIRA, 2011).



Trabalhadores da Mineração Serra Grande

One of the research results showed that despite the growth in the Municipality's HDI (in all categories, except Income-HDI), Crixás presented indices of economic and social developments much lower than the averages in the state of Goiás and in Brazil (FERNANDES; LIMA; TEIXEIRA, 2007; FERNANDES; LIMA; TEIXEIRA, 2011).

In a comparison of the HDI among the 242 municipalities in Goiás, measured in 1991, Crixás had the 129th best average.

In 2000, it fell to 178th place, a considerable drop. Interestingly, many non-mining municipalities in Goiás got a much better result over the same period (FERNANDES; LIMA; TEIXEIRA, 2007; FERNANDES; LIMA; TEIXEIRA, 2011).



Garimpo clandestino abandonado

Poverty in Crixás – which affected 40% of the population in 2000 - caught the researchers' attention for the city has one of the most profitable gold mines in the country. The study found that "the HDI values in the host-municipality of the Great Gold Mine of Crixás, both for 1991 and for 2000, are comparable to those of a number of countries among the poorest in the world such as Bolivia, Guatemala, Equatorial Guinea and Mongolia" (FERNANDES; LIMA; TEIXEIRA, 2007; FERNANDES; LIMA; TEIXEIRA, 2011).

The study performed by CETEM also collected reports on the existence of high rates of mental retardation in the municipality, plus cases of hydrocephalus, Down's Syndrome and neurological problems, which may be related to contamination from mining (FERNANDES; LIMA; TEIXEIRA, 2007; FERNANDES; LIMA; TEIXEIRA, 2011).

Some of the Crixás residents interviewed by the CETEM team related the diseases to the occurrence of cyanide from the ore beneficiation process. The substance, highly toxic, was mixed in the tailings dams produced by Serra Grande Mining. The population is also aware of the accidents in the tailings dams and of the Vermelho River contamination. CETEM's research did not find the existence of a permanent environmental tracking work by Serra Grande Mining to check for leaks and other forms of environmental damage (FERNANDES; LIMA; TEIXEIRA, 2007; FERNANDES; LIMA; TEIXEIRA, 2011). In 2007, there was great apprehension among the traders in Crixás towards the fate of their businesses and the municipality's after the mine closed (FERNANDES; LIMA; TEIXEIRA, 2007).

From 2011 on, however, a new scenario was presented in relation to the permanence of mining in the region. The world conjuncture towards mineral assets appreciation, and the large increase in gold's final price has stimulated new research and the viability of uneconomic mines (FERNANDES; LIMA; TEIXEIRA, 2011). To get an idea, Serra Grande Mining started working at 700 m, with tunnels which,

when added together, reached 60 km long (O GLOBO, 2011).

In May 2012, AngloGold Ashanti acquired the remaining 50% stake in the joint venture it had with Kinross Gold Corporation at Serra Grande mine. The transaction amount was US\$ 220 million. Anglo expects an annual production of over 500,000 ounces. The company is producing about 134,000 ounces (or 4.2 tons of gold) (BRASIL MINERAL, 2012).

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