



Fornos artesanais para a queima de madeira e produção de carvão

Sérgio Vignes - Observatório Social

Productive chain of pig iron in Pará (PA) has irregularities

DATE

11/04/2011

DISTRICT

MA - Açailândia
MA - Bacabeira
MA - Pindaré-Mirim
MA - São Luís
PA - Marabá
PA - Parauapebas

LATITUDE

-

LONGITUDE

-

SUMMARY

Companies in the Carajás Steel Complex produce pig iron, a raw material for the production of steel. The activity uses slavelike labor similar to that at the charcoal kilns located in the Amazon rainforest and illegal extraction of wood from native forests for charcoal production, used as a source of thermal energy to produce pig iron from iron ore.

independent and use charcoal in reduction (MONTEIRO, 2004). Production, however, has had as the basis of its value chain: slavelike labor - which happens at charcoal kilns located in the Amazon rainforest - and illegal wood extraction from the native forest, for charcoal production (VERAS; CASARA, 2004).



Capa da revista Observatório Social.

Sérgio Vignes - Observatório Social

CASE DESCRIPTION

Before turning into steel, most iron compounds must be transformed into pig iron (primary iron). This production process can be done in different ways: reduction in blast furnaces, in fluidized-bed electric furnaces or in rotary kilns. The reduction in blast furnaces is the most used worldwide, and some plants use mineral coke as a reductor while others use charcoal (MONTEIRO, 2004).

The iron obtained in the blast furnaces can be of two types: steelmaking pig iron, which is used as raw material for steel production, and cast iron foundry, which features a silicon content 2% to 3% higher than steelmaking pig iron and is used in the production of parts for automotive and agricultural industries (FERREIRA et al., 2006). Similarly, there are two types of steelmaking companies: independent, which are characterized by small businesses dedicated to the production of pig iron, or integrated, engaged in the manufacture of various steel products, on a high production scale (MONTEIRO, 2004).

The Brazilian Amazon produces the best pig iron in the world, used mainly in the manufacture of automotive parts (VERAS; CASARA, 2004). Most of the region's steelmakers are

In recent decades, several steel mills that are dedicated to the production of pig iron have settled in Eastern Brazilian Amazon. The deployment of these industries was driven in the 1980s by tax incentives and lending policies implemented by the now extinct Programa Grande Carajás (PGC – the Great Carajás Program). The State's plans for the period predicted the emergence of an industrial complex along the Carajás Railroad Corridor (EFC – Estrada de Ferro Carajás) (MASON, 2004; MONTEIRO, 2006).

With 892 km, the railroad connects Parauapebas, in Pará, to São Luís, in Maranhão. It is controlled by Vale and began operations in 1985. The railway, which cuts through 22 municipalities in the two States, was constructed to mainly drain iron ore from the world's largest mineral province, Serra dos Carajás, which holds, among other metals, nickel, copper

and manganese. The wagons also carry several loads, such as soybeans, fertilizers and fuel to the capital of Maranhão State, from where they are exported to the whole world through the ports of Itaqui and Ponta da Madeira (BARROS, 2007).

The Carajás Steel Complex extends along the railroad. Most steelmakers are in Marabá, Pará State, while the others are in Maranhão, of which five are located in Pequiá, district of Açailândia (BARROS, 2007), one in Pindaré Mirim, and another in Bacabeira (MONTEIRO, 2004). These industries use the rail line to receive their main raw material, iron ore, and also to distribute pig iron to São Luís (BARROS, 2007).



With 15,128 km² and 233,462 inhabitants (IBGE, 2010a), Marabá is located in Southeast Pará, 485 km from Belém. The town has experienced several economic cycles, and today it is the economic and administrative center of a vast region of the "Amazonian agricultural frontier", besides having more than 200 industries, being the steel and the pig iron industries the most important (PREFEITURA MUNICIPAL DE MARABÁ, 2010).

The whole area of the Industrial District (ID) of Marabá, implemented in 1987 and 6 km from the urban headquarters of the municipality, is being expanded and revitalized. The first phase of the construction work will include the 11 steel mills that are already installed in the ID. In April 2010, the second phase of the construction started, which included the expansion of the district along 1.1 thousand hectares. In this area, approximately 150 industrial properties should be opened aimed at several productive segments such as optical fibers, metal-mechanics industry, furniture making, petroleum byproducts, among others. The last step of the ID enlargement works should contemplate Vale's steel mill Siderúrgica Aços Laminados do Pará (Alpa), scheduled to go into operation in 2013. Other enterprises for the production of pig iron, steel and metal-mechanics industry should also be deployed in the area (AGÊNCIA PARÁ DE NOTÍCIAS, 2010).

Açailândia, with 5,806 km² and 104,013 inhabitants (IBGE, 2010b), is 445 km of São Luís, in the West of Maranhão. With the decline of the timber industry, the steel industry has been

the sector that most generates jobs and foreign currencies for the municipality (PREFEITURA MUNICIPAL DE AÇAILÂNDIA, 2010). With the completion of the steelmaking company Aciaria Gusa Nordeste, in the Industrial District of Pequiá, in March 2011, it is expected that the production of pig iron from the five steelmakers is sent to this new enterprise, absorbing at least 520,000 tons of pig iron in the liquid form. The idea is that the steelmakers from the Açailândia complex will be able to work all their production capacity, which does not occur nowadays due to the high price of the ore and low value of the dollar (LIMA, 2010).

It was believed that the constitution of a first stage of the steel industry (pig iron production) in the Amazon would naturally lead to the emergence of the rest of the chain, forming an industrial complex and stimulating the local economy. However, almost 30 years later, the Carajás complex gathers only pig iron makers, whose production is exported almost in its entirety. In addition to this low economic return, the activity has generated a series of environmental and social problems in the region (MILANEZ; PORTO, 2008).

When the first steel mills were implanted, companies stated that charcoal would be obtained in large reforested areas. However, this did not occur since it is much cheaper to get charcoal from the native forest (VERAS; CASARA, 2004). Between 2005 and 2008, Ibama and the State Environmental Secretariat (Sema), collected data on the use of charcoal in the Marabá steel complex, proving that large steelmakers of Pará were the target market of the charcoal produced with illegally logged wood in the Amazon. It is estimated that annually up to five million cubic meters of native forest are deforested in Pará for charcoal production. According to parameters of the Ministry of Environment (MMA), 48 trees are required to produce just one ton of charcoal (CASARA; VIGNES, 2011).

Pig iron production takes up mainly charcoal and iron ore. Charcoal is used at the beginning of the production chain of steel, as a source of thermal energy and in reduction to produce pig iron from iron ore. As there is no sulfur in its composition, charcoal improves the quality of the pig iron and of the steel produced, consequently increasing the final price of the product (UHLIG; GOLDEMBERG; COELHO, 2008).

Charcoal comes from small charcoal kilns that burn wood from the native forest. The ore is supplied by Vale, which is also responsible for the logistics of pig iron export: apart from the railroad, the company owns a port terminal on the coast of Maranhão (VERAS; CASARA, 2004).

Charcoal production occurs by carbonization of wood in masonry kilns, through dispersed, little mechanized processes and highly dependent on human labor (UHLIG; GOLDEMBERG; COELHO, 2008). To produce a ton of pig iron, 875 kg of charcoal are required, on average (CEMIG, 1988 apud MONTEIRO, 2004), whose production, in turn, requires the use of about 2,600 kg of dry wood, generating a deforestation of at least 600 m² of primary forests

(MONTEIRO, 2004).

In Eastern Amazon, charcoal kilns are controlled by the Carajás steelmakers. Some steel mills are owned by large conglomerates, with operations in nearly all Brazilian territory and also abroad. The Queiroz Galvão group, for example, owns Siderúrgica do Maranhão S.A. (Simasa) and Companhia Siderúrgica Vale do Pindaré, in Açailândia. The Gerdau Group controls Maranhão Gusa S.A. (Margusa), in Bacabeira (MA) (VERAS; CASARA, 2004).

The steel industry favored land concentration directly, since many companies in the region eventually acquired large tracts of land for the installation of monocultures. According to social movements and cases reported in the media, many of these purchases are made through land grabs and violence against squatters. It also favored land concentration indirectly, because as they buy wood from third parties, charcoal kilns lower the cost for land cleaning [for the farmers], favoring the expansion of pastures (MONTEIRO, 2004 apud MILANEZ; PORTO, 2008).



Even at the charcoal kilns where there is no slavelike labor, legislation is systematically refused, because workers do not receive personal protective equipment and neither have accommodation nor medical assistance. Moreover, they are not properly recorded in the Work and Social Security Card and, therefore, are not entitled to the social benefits provided in labor legislation (VERAS; CASARA, 2004).

The claim from the steel mills that charcoal kilns are only suppliers is not accepted by the Public Prosecutor for Labor or by the Ministry of Labor. The bodies understand that steel mills are directly responsible for everything that happens in the charcoal kilns, because they are the ones who build the ovens used in burning the wood that produces charcoal and because they require exclusivity in the delivery of inputs (VERAS; CASARA, 2004).

The Ministry of Labor and Employment started, in 1996, an intensive inspection work in charcoal kilns which resulted, in 1999, in the Conduct Adjustment Declaration (CAD) signed between steel mills, the Public Prosecutor for Labor and the Ministry of Labor and Employment. With the CAD, there was

an evolution in labor relations between charcoal producers and their employees. However, in recent years, given the growth of charcoal production activities, labor relations disorders rose again, among other reasons (ICC 2010).

As plants failed to meet CAD, from 2003 on, the Public Prosecutor for Labor began to make steel mills responsible for slave labor, having fined most of them more than once (CAMARGO, 2006 apud MILANEZ; PORTO, 2008). The Citizen's Charcoal Institute (ICC) was created with the objective of assisting them in the fulfilment of the CAD and the Commitment Letter - signed in August 2004 by several productive sectors, including steel – for the elimination of slave labor in the production of charcoal and formalization and modernization of labor in the productive chain of pig iron (ICC 2010).

Researchers at the Federal University of Pará (UFPA) reported that approximately 60% of the charcoal that fuels the region's pig iron makers are produced without proper licensing (CAMARGO, 2006 apud MILANEZ; PORTO, 2008). The Brazilian Institute of Environment and Renewable Natural Resources (Ibama) estimates that this percentage reaches almost 80% (BRASIL, 2005 apud MILANEZ; PORTO, 2008).

Between 2005 and 2007, Ibama visited different steel mills in the States of Maranhão and Pará, encountering several irregularities, such as: receiving loads from trucks without the Authorization for the Transport of Forest Products (ATPF), using charcoal from areas without a management plan, and charcoal produced without authorization of deforestation. In addition, they found companies running without operation license and shell companies (SATO e COSTA, 2005; BRASIL, 2006; 2007; HASHIZUME, 2007; MACEDO, 2007 apud MILANEZ; PORTO, 2008).

In 2007, the Association of Carajás Steel Companies (Asica) announced the creation of a financial fund – the Carajás Forest Fund - for the reforestation of the native forest in the region. Companhia Siderúrgica do Pará S/A (Cosipar), Terra Norte, Cosima and Gusa Nordeste are in the group of the companies that participate in the reforestation project. The fund aims to plant trees along the entire length of the railway that transports the Carajás pig iron production to the port of Itaqui (BRASIL MINERAL, 2007a).

At the end of 2007, Vale interrupted the supply of iron ore to the pig iron producers of Pará and Maranhão that used charcoal produced in areas that contributed to the Amazon deforestation (BRASIL MINERAL, 2007b; Hashizume, 2007). The suspension in the supply of raw materials affected Cosipar, Ferro Gusa do Maranhão Ltda. (Fergumar), Siderúrgica do Maranhão S/A (Simasa) and Usina Siderúrgica de Marabá Ltda. (Usimar) (PARÁ NEGÓCIOS, 2007; HASHIZUME, 2007).

In addition to labor problems and illegal exploitation of native wood, the region suffers from other problems. Atmospheric emissions are among the main environmental impacts caused by the steel industry. In the production of pig iron, there is the

generation of the blast furnace gas composed of CO₂, carbon, nitrogen and hydrogen. The emission of CO₂ and methane is due, above all, to the burning of charcoal in iron ore reduction. By increasing the amount of carbon in the atmosphere, these gases contribute to climate change (MIRANDA, et al., 1999 apud MILANEZ; PORTO, 2009).

An alternative to environmental problems would be the creation of the Sustainable Forest District (DFS) of Carajás, with an area of approximately 25 million hectares, between the States of Pará, Maranhão and Tocantins. According to the proposal, presented in 2006 by the Brazilian Forest Service (SFB), DFS would be a "geo-economic and social complex established in order to define areas where it will be prioritized the implementation of public policies that stimulate integrated development with forest-based activities" (MAPA DA INJUSTIÇA AMBIENTAL E SAÚDE NO BRASIL, 2009; MMA, 2010).

DFS implementation is being planned to recover the vegetation cover in the region and ensure the existence of a complex and of a sustainable forest economy, with maximum social inclusion. The strategic actions to be prioritized will be based in the reforestation and recovery of degraded areas (MMA, 2010).

The Carajás DFS would have capacity to produce 5 million logs for the industry and 17 million m³ of wood for charcoal production. In this perspective, the Carajás DFS would meet the demand for charcoal by the steel mills of the Carajás Corridor, without aggravating deforestation of native vegetation for their production (MMA, 2010). Its implementation is seen as a chance to redeem a good portion of the local residents' dependence on the steel mill headquarters that have been ruling local development (MAPA DA INJUSTIÇA AMBIENTAL E SAÚDE NO BRASIL, 2009).

Despite the efforts of different agents, the deficiencies remain in the region. In 2010, Ibama officers confiscated 27.7 tons of pig iron, manufactured with illegal charcoal by Siderurgia do Pará (Sidepar), in Marabá. The steel company had its Trading System and Transport of Forest Products (Sisflora) access blocked and was fined. Until the suspension of the sanction by Ibama, the industry is prevented from purchasing forest products (BRASIL MINERAL, 2010).

A report by the Social Observatory Institute held in 2011 in the region shows that the steel production chain remains in trouble. Now, steel mills are benefiting from predatory processes to ensure the supply of charcoal, produced with wood taken from environmental preservation areas. The scheme is only possible thanks to corruption, which ensures the maintenance of the predatory flow (CASARA; VIGNES, 2011).

GEOGRAPHIC LOCATION

BIBLIOGRAPHIC REFERENCES

- AGÊNCIA PARÁ DE NOTÍCIAS. Distrito industrial de Marabá atrai novos empreendimentos. In: Instituto Brasileiro de Mineração (IBRAM), 28 jan. 2010. Disponível em: http://www.ibram.org.br/150/15001002.asp?ttCD_CHAVE=100310. Acesso em: 15 out. 2010.
- BARROS, Carlos Juliano. O efeito colateral do progresso. Repórter Brasil, 04 jan. 2007. Disponível em: <http://www.reporterbrasil.org.br/exibe.php?id=833>. Acesso em: 13 out. 2010.
- BRASIL MINERAL. Reforestamento. Produtores de gusa criam fundo financeiro para Carajás. Brasil Mineral OnLine n. 292, 8 mar. 2007a. Disponível em: <http://www.brasilmineral.com.br/BM/default.asp?COD=2838&busca=&numero=292>. Acesso em: 15 out. 2010.
- _____. Ferro-gusa. CVRD corta fornecimento para produtores irregulares. Brasil Mineral OnLine n. 312, 25 jul. 2007b. Disponível em: <http://www.brasilmineral.com.br/BM/default.asp?numero=312>. Acesso em: 15 out. 2010.
- _____. Ferro-gusa. Ficais do Ibama apreendem carvão ilegal na Sidepar. Brasil Mineral OnLine n. 445, 4 jan. 2010. Disponível em: <http://www.brasilmineral.com.br/BM/default.asp?COD=4808&busca=&numero=445>. Acesso em: 15 out. 2010.
- CASARA, Marques; VIGNES, Sérgio. A floresta que virou cinza. Observatório Social, fev. 2011, edição especial. Disponível em: http://www.observatoriosocial.org.br/portal/images/stories/publicacoes/revista_especial_por.pdf. Acesso em: 06 abr. 2011.
- FERREIRA, Gilson Ezequiel; CALAES, Gilberto Dias; AMARAL, José Alexandre Gurgel do; KRUGER, Paulo Von. A Indústria Brasileira de Gusa de Mercado. Livro da Série Estudos e Documentos n. 66. Rio de Janeiro, CETEM, nov., 2006. Disponível em: <http://www.cetem.gov.br/publicacao/CTS/CT2006-071-00.pdf>. Acesso em: 23 jul. 2012.
- HASHIZUME, Maurício. Combinação de cadeias produtivas define quadro socioambiental. Parte 2: As Cadeias (Ferro-gusa, Carvão, Gado e Madeira). Repórter Brasil, 29 nov. 2007. Disponível em: <http://www.reporterbrasil.org.br/exibe.php?id=1238>. Acesso em: 25 out. 2010.
- IBGE. Instituto Brasileiro de Geografia e Estatística. Marabá (PA). In: IBGE Cidades, 2010a. Disponível em: <http://www.ibge.gov.br/cidadesat/xtras/perfil.php?codmun=150420&r=2>. Acesso em: 08 fev. 2011.
- _____. Açailândia (MA), 2010b. In: IBGE Cidades, 2010a. Disponível em: <http://www.ibge.gov.br/cidadesat/xtras/perfil.php?codmun=210005&r=2>. Acesso em: 08 fev. 2011.
- ICC, Instituto Carvão Cidadão. A empresa. Disponível em: <http://www.carvaocidadao.org.br/empresa/>. Acesso em: 25 out. 2010.
- LIMA, Wilson. Açailândia atrai investimentos e se torna metrópole do futuro. Prefeitura Municipal de Açailândia, 08 set. 2010. Disponível em: <http://www.acailandia.ma.gov.br/2010/index.php?op=noticia&id=134>. Acesso em: 14 out. 2010.
- MAPA DA INJUSTIÇA AMBIENTAL E SAÚDE NO BRASIL. Indústria guseira, contaminação da água, falta de segurança e condições impróprias à vida e à saúde dos moradores do Distrito Industrial de Pequiá (Açailândia), 04 out. 2009. Disponível em: <http://www.confliotoambiental.icict.fiocruz.br/index.php?pag=ficha&cod=50>. Acesso em: 14 out. 2010.
- MILANEZ, Bruno; PORTO, Marcelo Firpo de Souza. A ferro e fogo: impactos da siderurgia para o ambiente e a sociedade após a reestruturação dos anos 1990, IV Encontro Nacional da Anppas, 4 a 6 jun. de 2008, Brasília (DF). Disponível em: <http://www.anppas.org.br/encontro4/cd/ARQUIVOS/GT6-61-8-20080509163054.pdf>. Acesso em: 14 out. 2010.
- MMA – MINISTÉRIO DO MEIO AMBIENTE. DFS Carajás. Disponível em: <http://www.mma.gov.br/index.php?ido=conteudo.monta&idEstrutura=95&idMenu>

=4881. Acesso em: 25 out. 2010.

MONTEIRO, Maurílio de Abreu. Siderurgia na Amazônia Oriental brasileira e a pressão sobre a floresta primária. II Encontro da Anppas, 26 a 29 mai. 2004, Indaiatuba, São Paulo.

Disponível em:

http://www.anppas.org.br/encontro_anual/encontro2/GT/GT16/gt16_maurilio.pdf

. Acesso em: 14 out. 2010.

_____. Em busca de carvão vegetal barato: o deslocamento de siderúrgicas para a Amazônia. Novos Cadernos do Núcleo de Altos Estudos Amazônicos (NAEA), v. 9, n. 2, 2006.

Disponível em:

<http://www3.ufpa.br/projetomineracao/docs/estrut/NCN-2007-87.pdf>. Acesso

em: 14 out. 2010.

_____. A produção de carvão vegetal na Amazônia: realidades e alternativas. Paper do Núcleo de Altos Estudos Amazônicos (NAEA), Edição n. 1, junho 2004.

Disponível em:

<http://www.ufpa.br/naea/papers.php?mvitem=3>. Acesso em: 23 jul. 2012.

PARANEGÓCIOS. Vale corta o fornecimento de minério de ferro para as primeiras quatro guseiras do pólo de Carajás. In: Instituto Brasileiro de Mineração (IBRAM), 26 out. 2007.

Disponível em:

http://www.ibram.org.br/150/15001002.asp?ttCD_CHAVE=45918. Acesso em:

15 out. 2010.

PREFEITURA MUNICIPAL DE AÇAILÂNDIA. Histórico da cidade, 2010.

Disponível em:

<http://www.acailandia.ma.gov.br/2010/index.php?op=historia>. Acesso em: 14

out. 2010.

PREFEITURA MUNICIPAL DE MARABÁ. A Cidade - Histórico, Localização, Dados e Economia.

Disponível em:

http://www.maraba.pa.gov.br/a_cidade.htm. Acesso em: 14 out. 2010.

UHLIG, Alexandre; GOLDEMBERG, José; COELHO, Suani Teixeira. O uso de carvão vegetal na indústria siderúrgica brasileira e o impacto sobre as mudanças climáticas. Revista Brasileira de Energia, v. 14, n. 2, 2º Sem. 2008, p. 67-85.

Disponível em:

http://www.acendebrasil.com.br/archives/v14n02_o-uso-de-carvao-vegetal-na-industria-siderurgica-brasileira-e-o-impacto-sobre-as-mudancas-climaticas_1.pdf. Acesso em: 14 out. 2010.

VERAS, Dauros; CASARA, Marques. Escravos do Aço. In: Observatório Social, Florianópolis - SC, jun. 2004.

Disponível em:

http://www.os.org.br/arquivos_biblioteca/conteudo/1634revista6_2.pdf. Acesso

em: 14 out. 2010.