Artisanal and small-scale gold mining in the North of Brazil
(Amapá and the North of Pará)

Armin Mathis
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Preface

This study: ‘Artisanal and small-scale gold-mining in the North of Brazil’ was commissioned by WWF Guianas to WWF Brazil as part of the ‘Guianas Sustainable Natural Resources Management Program’, a program executed by WWF Guianas in the three Guianas from 2007-2011 and funded by the Kingdom of the Netherlands, the French FFEM and WWF Netherlands.

The study was mainly coordinated by Dr. Armin Mathis, General Director of the Centre for Advanced Amazon studies at the Federal University of Pará, Belem, Brazil. The main objective of the study was to analyze the situation of small-scale gold mining in the North of Pará and neighboring Amapá; to obtain a better insight of the movement of many Brazilian ‘garimpeiros’ to the three Guianas for the past 10 years. The total number of garimpeiros in the Guianas working in gold mining is now estimated between 40,000-60,000 people.

The gold rush to the Guianas can obviously be explained by the vast rise of the gold price since 2000. Indeed, from a mere 300USD per troy ounce in January 2000, the international gold price reached nearly 2,000USD/troy ounce by the end of 2011, and the trend seems ever continuing. In areas with many gold deposits like in the Guianas, this leads to an enormous ‘gold rush’ by poor people both from the Guianas and Brazil; helped with the technology (leading to more environmental destruction) of the latter.

The study reveals that the production of gold in Pará and Amapá was much higher in the past (the seventies and eighties) than it is now and this can be explained by two fundamental reasons:

- The gold-mining deposits have now largely been depleted in these areas of North Brazil
- The gold remaining is in protected areas (60% of the state of Amapá is under some form of protection) where mining is prohibited by law. Repression from the State for those who break the law is severe, just like in French Guiana.

So, with Brazilian ‘garimpeiros’ being chased out of protected areas in Brazil, new areas nearby are explored, which is why they come in large numbers to Suriname, Guyana and French Guiana. Deposits in these countries are still large, and control in the interior is weak, especially in Suriname and Guyana.

One of the conclusions of the study is that although coordinated action by armed forces against Brazilian artisanal miners will certainly continue, it will never manage to extinguish the activity in the Guianas as the gold deposits in these countries are huge. Hence, further migration to especially Suriname and Guyana (where control is less than in French Guiana) will continue.

Another conclusion states that alternatives need to be presented to the miners. Either by offering them regulated areas where they can work in a social and environmentally responsible way or by offering them alternative employment.

Notably the study concludes: ‘for an intervention to last in sustainability, the first thing to do is to perceive the garimpeiros and accept them for who they really are: social actors endowed with autonomy and self-determination’.

Dominiek Plouvier, Regional Representative WWF Guianas, Paramaribo, February 2012
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1. The history of artisanal gold mining in the Amazon

The current cycle of artisanal and small-scale gold mining in the Amazon dates back to 1958 when the first deposits of gold were discovered in the Tapajós, a region with centuries-long history of extractive exploitation of forest products, including natural rubber. Gold prospecting however was to structure itself in a very different way from those traditional activities.

Unlike the situation in the rubber tapping areas where the tapper’s income depended on his production and the selling price of rubber, the ‘owners’ of gold working areas appropriated the income stemming from working deposits with high natural productivity entirely for themselves. In the beginning, a worker in a gold working area was paid a fixed salary regardless of the volume of production. It depended on the market value of the extracted product because the daily rate was stipulated in gold. Based on the amounts recorded in the literature available, on average, the worker’s pay was fixed at around 50 grams of gold a month\(^1\), about 25% of the average production of an individual, which was 200 grams a month\(^2\).

The first signs of a crisis in gold mining activities appeared in the 1960s. Considering that the rudimentary equipment used in the early days of prospecting in the Tapajós was only capable of retrieving half of the gold contained in the deposits, the amounts produced showed that the alluvial deposits they exploited were very rich indeed\(^3\).

The pattern of events that followed was typical of this kind of mining which invariably begins in alluvial deposits with a high level of natural production. All the alluvial deposits were worked out without any modifications to the manual extraction techniques employed. After a decade of such working, productivity

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\(^1\) In addition to the daily pay, miners were fed by the mine owner who usually paid for transport to the gold working area as well.

\(^2\) All the general data on artisanal mining was gathered by the author or compiled from available sources. For details see: Mathis (2003), (Mathis 1998), (Mathis, Brito, Brüseke 1997), (Mathis 1996), (Mathis 1995a), (Mathis 1995b).

\(^3\) The average gold content in alluvial deposits at the beginning of the current cycle was 18 g/m\(^3\)
began to drop off and the average production per worker fell to 150 grams per month, and it appeared that the reduced levels of alluvial gold content in the deposits would put an end to artisanal mining in the region.

As the crisis set in however, a set of changes began to take place in the external factors that determined the organisational structure of the mining activities and, as a result of them, the activity was momentarily reinforced and managed to get over the crisis.

Among the factors responsible for the phenomenon were:

⇒ A significant increase in the price of gold in 1971, reflecting the international financial crisis then in course and the gradual dwindling of the political and economic hegemony of the United States.

⇒ The opening up of the Trans-Amazon highway and the Brasília-Cuiabá highway which facilitated the connection of Itaituba with the financial and commercial markets in the south of Brazil and created a situation that enabled the municipality to become a commercial centre in the gold-bearing province. The federal government’s ‘discovery’ of the region in the process of implementing its colonization programme in the 1970s led to a considerable increase in the presence of the State and unleashed a strong influx of migrants to the region.

All those changes inevitably influenced the social organisation of prospector gold mining. The former salary, whose monetary equivalent depended on the price of gold alone and not productivity, gave way to a participative system and created a form of remuneration where earnings were disassociated from the length of time worked and associated instead to the market value of the mineral produced (market component), to the productivity of the deposit being worked (nature component). The system was known as “meia-praça” (something like ‘Half and

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4 That process actually began in 1960 and was later marked by the suspension of the convertibility of dollar to gold in 1971 and the creation of the free exchange rate system in 1973.

5 In the period from 1970 to 1980 the population of the municipality of Itaituba jumped from 12,690 to 39,829 (data of the Brazilian Geography and Statistics Institute- IBGE).
Half’\(^6\), where the worker(s) would generally be entitled to half the eventual production and the proprietor of the area being worked would meet all the costs involved. The introduction of this new work regime, whereby the individual worker’s gains went up from 50 grams a month to 75 grams a month, cannot be attributed to capital-labour relations alone; other factor involved needs to be elucidated to explain the changes.

The government programmes encouraging people to settle in the Amazon region brought in waves of migrants, not only the contingents of landless rural poor from the Brazilian Northeast but also considerable numbers of small businessmen and traders, owners of a certain amount of capital and anxious to invest it. Some of them opted to invest in commerce and it expanded greatly after the city had become established as the support centre for the gold mining activities. Others discovered that the half and half system enabled them to invest in gold prospecting without having to set up the usual infrastructure and logistics installations and had the added advantage of transferring half of the risks of their prospecting ventures to the workers.

The opening up of gold mining to small and medium sized capital coincided with a huge availability of labour stemming from the failed settlement projects in the Amazon and that coincidence led to a substantial increase in gold production in the region. The tendency was further boosted by the increase in gold prices on the international market, which, allied to improved productivity, tripled the earning of the workers in gold mining activities.

\(^6\) The meia-praça (half and half) system was partly motivated by the desire of many workers to get away from the salaried work system and their finding themselves without the resources to finance prospecting activities on their own and open up new workings. In the early days of its adoption, some miners were ‘granted’ ‘meia-praça’ status by the owner of the gold working area. That meant that the owner shouldered the prospecting expenses and should the miners find any worthwhile deposits, then they would share the returns with whoever was financing the food and providing the machinery. Later the system evolved and mine workers coming to work in gold workings already in operation would establish labour relations with the owner of the machinery in charge of the operation who had permission from the owner of the area to work a certain part of it. Another version of the system was established between artisanal miners and traders. The trader would supply food and the means of production to a group of miners who would pay him back with a half share of whatever they produced.
With the establishment of the new working regime, the technology used to extract the gold began to change as well. The system whereby the worker’s pay depended on production, which had established itself as the normal pattern for hiring labour, was maintained. What began to change, however, was the size of the worker’s share which went down from 50% to 40% or even 30%. The proprietors declared that the change was a result of the increased cost of production and the workers accepted the adjustment because the loss in the percentage of production they received was compensated by the enhanced value of gold in the markets.

Thus the high price of gold on the international market in 1979/80 not only helped to reduce the workers percentage participation in the fruit of their labours, but it was also responsible for the rapid spread of the use of new techniques for extracting alluvial gold throughout the region. Due to the rich content of new deposits that were being exploited, previously inaccessible to small prospectors and the new high price of gold, it became feasible for most of the mine owners to mechanize production and to do so without having recourse to outside capital, but merely by re-investing profits from the activity itself. Thus the increase in international gold prices was responsible for the speed with which new forms of extracting materials present in the natural environment spread through the region.

For some time that rapid spread managed to disguise a tendency that eventually showed itself to be absolutely disastrous for nature and the environment – the low levels of productivity associated to the mechanised forms of extraction. While it is true that the substitution of human energy by fossil fuel energy practically doubled gold production per individual, that increase in physical production did not involve working the gold-bearing deposits more efficiently; it came about because much greater volumes of deposits were being worked by fewer individuals. By using machines, the gold workers were able to process 7.5 times more material than when the processing was all done manually.

Once more the gap between costs and returns was closed by the increased price of gold on the markets and maintained the workers’ gains. However, the mechanism
caused highly negative impacts on the natural environment. In mechanised extraction, each gram of gold involved the use of a volume of materials four times greater than it did in the times before the machines boosted the activity’s power of destruction.

The Federal Government, at that time (late 1970s) facing a severe economic crisis because of its balance of payments situation and the brutal increase in the price of petroleum, was not slow to spot the increase in gold production stemming from mechanisation, or the increased value of that production associated to the high price of gold on the international market.

Minister of Mines and Power César Cals, who took office in March 1979, determined that the national goal for gold production was to achieve an increase from the then current level of 4.5 tons a year to 100 tons a year by 1985. Given that the goal could only possibly be achieved with the help of an expansion in gold prospecting, the Ministry had to amend its previous policy whereby all gold mining was restricted to big industrial mining ventures. However, during the time the Ministry was re-orientating its mining policies, a new factor appeared on the scene that was to lead to further modifications in federal mineral extraction policies.

At the beginning of the 1980s a very rich gold-bearing deposit was discovered near to the huge iron ore project of Carajás in the southern part of Pará state. It came to be known as the “Serra Pelada” (Bare Mountain) mine. The spot immediately became the focus of intense artisanal mining and in a very short time attracted more than 30,000 people. That influx caused so much concern to government security bodies that in May 1980 a federal intervention was ordered and

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7 The most visible result of mechanisation is the silting up of rivers and steams in the gold working areas.
8 The data only represents the officially registered legal production that was declared and paid taxes. Because most of the gold produced was sold in informal transactions some of the changes to mining policy were directed at intensifying inspection and control to increase the proportion represented by official production.
9 Partly because the gold workings were situated in a region where a guerrilla movement had installed itself in the 1970s and where there were also serious conflicts involving the tenure of the land.
repressive forces attached to new National Department of Mineral Production, created within the sphere of the Ministry of Mines and Energy’s new policy on artisanal mining and responsible for the execution of the Ministry’s policies, installed themselves in the region. Interventions were also ordered in other regions where gold working activities were in course.

There was no intention to alter labour-capital relations in any way or even the relations between miners and the environment; the only driving interest behind such interventions was to achieve an official increase in production of the precious metal without bothering to seek for solutions to the terrible harm mechanised gold working was doing to the environment. Increasing uncertainty as to the future of Serra Pelada, and the fact that every rainy season all activities ceased, led many individuals to abandon the place and seek their fortunes in other regions.

Ten years after the mechanisation of gold extraction in the Amazon region, the deposits of alluvial gold began to show signs of exhaustion. But what was to really affect it most and bring about a general crisis in all small-scale mining in 1990, at which time there were an estimated 400,000 people working directly on gold extraction in the Amazon region (MAC MILLAN 1993), was not the influence of nature or the dwindling productivity, but political decisions made in the sphere of the Federal Government; above all the Collor Plan. Launched in March 1990, it drastically cut the domestic price of gold and increased the price of materials needed for its production. There was also the interdiction of the Yanomami indigenous area where more than 40,000 small-scale miners were working in the period from 1987 to 1990. There were other similar conflicts, albeit on a smaller scale, in the territory of the indigenous group Waiãpi in Amapá. Those conflicts only ceased after the indigenous reserve was demarcated in 1994/1995.

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10 Between 1979 and 1990, Tapajós alone produced around 370 tons of gold far more than manual working had managed to produce in twenty years (production from 1958-1978: 258 tons). For the period 1990/1991 all the indicators we use to register artisanal mining tendencies show negative values for the period, a tendency that was to intensify in the period 1992/93.
2. The history of artisanal gold mining in Amapá

Although most of Brazil’s recent history involving small-scale gold mining is associated to the Tapajos river basin, mineral extraction in the Amazon actually goes back much further.

Lestra and Nardi (1984) report that in 1602, Dutchmen entered the Amazon estuary and went up the Maracá River where they discovered gold. That event could be considered the beginning of gold prospecting in the Amazon. The Dutch remained in the area of the Igarapé Pedreira creek for ten years when they were expelled by the Portuguese explorer Pedro Teixeira who was returning from an exploratory expedition up the Amazon River.

Another author, Lopes (1983) mentions the presence of English settlers in the Cajari River during the same period, presumably interested in exploiting the mineral deposits there. The Jesuits that accompanied Pedro Teixeira’s expedition reported the existence of several mines in the territory of what was then known as Capitania do Cabo Norte (North Cape Province) where the modern state of Amapá is located).

Gold prospecting and mining activities intensified in Amapá towards the end of the 19th century. In 1882 gold was discovered in a small river called Igarapé Flexal, south of the city of Amapá. The discovery was attributed to ‘creole’ prospectors from French Guiana who introduced their own traditional knowledge of gold prospecting and mining into the region.

However, the discovery that really changed the history of small-scale gold mining in the region was the big gold discovery at what is now known as the Lourenço gold fields. There are two versions of how the place got its name. The first (DNPM 1986, Ferreira 1990) claims that it was a Brazilian named Lourenço, residing in what was then Dutch Guiana that made the discovery, and that he had followed the
recommendations of some Saramaccans (forest-dwelling maroons) from French Guiana and gone up the Calsoene River prospecting for gold.

The rich deposits Lourenço discovered eventually attracted thousands of prospectors to the region. Ferreira (1990) estimates that at the height of the mining activities there were as many as 46,000 people in the area. The other version has it that two gold prospectors from the state of Pará, Germano and Firmino Ribeiro, detected the presence of gold in the Calsoene River sometime between 1893 and 1894.

Annual production in the region had got up to 5 tons a year by the end of the 19th century. That was sufficient to justify the building of a 110 km long railway line linking the Lourenço mines to a place called Firmino on the lower reaches of the Calsoene. The Lourenço discovery not only attracted the attention of prospectors in neighbouring countries, leading them to migrate into the area, but it exacerbated the ongoing conflict between Brazil and France in regard to the frontier between the two.

An example of the complicated situation is the attempted implementation of industrial-scale mining under the aegis of the Anglo French Gold Mining Company. However, the company never actually went operational and abandoned the region after the signing of the Treaty of Switzerland on December 1, 1900, which declared that Amapá was part of Brazil and not French Guiana, thereby putting an end to the various efforts of the French to control all the territory between the Oiapoque River and the Amazon. Even after the gold rush on the Calsoene river had subsided, prospecting for gold continued, and, throughout the 20th century, it was an important economic activity in the region.

During the 1930s new centres of gold mining activities in Amapá appeared on the Cassiporé, Vila Nova (Igarapé Lino) and Araguari rivers. All of them attracted large
influxes of migrants mostly from neighbouring countries, or from the Caribbean (DNPM 1986).

When the ICOMI company began its industrial extraction of manganese ore in Serra do Navio, small scale gold mining began to lose importance in the regional economic scene, but it has never entirely ceased. In the late 1950s, Joel Ferreira, a trader with activities in the Lourenço region, introduced the use of mechanical equipment (tractors, crushers, mills, high pressure water cannons for washing down banks etc.). As the years went by, he increased the areas under his control by applying for legal mining permissions to extract gold and eventually had 2,000 hectares in his name. At the beginning of the 1980s he transferred control of his titles to a mining company called Mineração Novo Astro (MNA) which set up an industrial operation, first with an open-cast operation directed at the surface deposits and later, in the same decade, beginning underground mining of primary gold deposits.

The setting up of the MNA’s industrial operation in a region that was traditionally the stage for small prospector operations inevitably led to conflicts between the company and local populations in the areas around the company’s operations. Amapá State Government records show that in 1985 there were around 450 families living in the Lourenço area and the total population was estimated at 2,500 people. Once the big mining operation got under way, the local population called on the company to use its installed infrastructure to provide social services that the public authorities had always neglected to provide, namely health care, transport, access road maintenance, electricity, and so on. In fact, eventually the public administration itself came to depend on the company which gave support to the few government bodies and institutions in the region by putting in water supply, and providing food free of charge to teachers, primary healthcare personnel attached to the National Health Foundation, employees of the local
administrative sub-division of the municipal authority and the even the local contingent of the uniformed police force\textsuperscript{11}.

The greatest tension in relations between residents and the company were related to disputes over the areas included in the mining concessions awarded to the company and the area that had been allocated for exploitation by prospectors. Conflicts of one sort or another existed throughout the company's existence, but the really big one broke out in 1987, when the small miners organised a movement against the company. In the negotiations that followed, in which the government of the then Territory of Amapá interfered directly, it was agreed that a few groups of machines belonging to prospecting operations would be allowed to work within the areas of the company's concessions.

The MNA wound up its operations in 1995, announcing that the deposits had been exhausted and declaring an overall production of 20 tons of gold\textsuperscript{12}. At that moment the company signed an agreement, drawn up by the State Government, in which it promised not to cancel the registration of the company or the concessions with the DNPM in Brasilia so that their ownership could be transferred directly to the local miners.

Once the mining company had withdrawn from Lourençao there was an intense exodus of the local population, many of the company buildings were entirely abandoned and the underground mine was sealed off to prevent access of the prospectors. Those small miners that did stay on founded the Cooperative

\begin{itemize}
\item \textsuperscript{11} According to the company's records, starting in 1990 it supplied morning coffee, lunch and dinner to 30 people a day that were not company employees, amounting to an annual expenditure of 180 thousand dollars.
\item \textsuperscript{12} Although the federal environmental authority SEMA (Special Department for the Environment) and state environmental authority CEMA (Special Coordinating Body for the Environment of Amapá) stated that the company had complied with all the legal requirements in installing its activities and in handing back the area on its withdrawal, the concept used to define "Recuperation of Degraded Areas" set out in the legislation must be questioned as well as the competence of the respective authorities. A close look at the final report of the 'Programme for the Recuperation of Degraded Areas and Environmental Monitoring' which the company handed in when it passed the area over to the state government, and an \textit{in loco} appraisal are enough to show the dissonance between what is in the document and the reality on the ground.
\end{itemize}
Association of Lourenço Miners (COOGAL), which installed itself in one of the abandoned buildings of the MNA.

On October 7, 1995, the _Mineração Novo Astro_ company and the COOGAL signed an agreement entitled “Private contract of rights concession” which was witnessed by Amapá’s State Governor João Alberto Rodrigues Capiberibe and the Head of the State Planning Department, Mary Helena Allegretti. The document provided for the transferral of all rights associated to the areas referred to in Mining Licensing Documents n° 291/86 and 292/86 to the miners.

The COOGAL cooperative committed itself to fulfil all the environmental obligations inherent to the mining activities, to formally exempt the MNA from any obligations or charges stemming from the concessions and to duly register the agreement and commitment with the DNPM and any other bodies necessary. The company’s obligations were limited to signing the transfer of concession documents and supplying the COOGAL with any technical information or technical documents it possessed.

The 15 years that have now gone by since the mineral rights were transferred to the COOGAL have been marked by a series of internal disputes for control of the cooperative and irregular administrative acts committed by its directors.

3. **Mining legislation**

The main legal framework governing mining activities in Brazil is set out in the Mining Law (Law 227 dated February 28, 1967) and there is other legislation referring to environmental aspects in which there are specific provisions dedicated to artisanal mining and the regulations that govern it (Law n° 7.805, dated July 18, 1989, which institutes the artisanal mining permissions; and Law n° 11.685, dated June 2, 2008, which institutes the Artisanal Mining Statute).
The Brazilian Mining Law declares that all mineral deposits are the property of the Federal Union, and that it alone has the right to issue mineral exploration licenses by means of its National Mineral Production Department or transfer the right to work areas on an industrial scale by decree of the Ministry of Mines and Energy. The owner of the land where mining is carried out is guaranteed a share in the results of any mining operations and they are classified into five different modalities:

- Concessions issued by Ministry of Mines and Energy in the form of a Ministerial Decree
- Authorisation by means of a License issued by the DNPM
- Licenses issued by a local authority duly registered with the DNPM, for the extraction of mineral substances to be used exclusively in building and road works (sand, gravel, etc.)
- Permission to carry out artisanal mining granted by Decree of the DNPM
- Monopoly Regime.

Exploitation of a given mineral deposit can only take place when an authorization to explore and extract has been effectively issued.

The mining law defines artisanal mining as: (1) a rudimentary form of mining; (2) carried out in deposits of a specific type; (3) by means of self-sustained individual labour only. The law also specifies the mandatory document needed to conduct the activity, the so called Prospector Registration (Matricula de Garimpeiro) which came to be issued by a body known as the Coletoria Federal. After the ratification of the Federal Constitution of 1988, the Law also made it possible to reserve certain areas exclusively for artisanal mining in which case they are marked off by implementing Artisanal Mining Reserves. The Law also foresees the possibility of prohibiting prospecting and artisanal mining in cases where there is believed to be misuse or wastage of the country’s mineral assets.
The 1988 Constitution formally recognises artisanal mining as a legitimate form of mineral extraction and underscores the prerogative of the Federal Union to define the areas where it can be undertaken by associative organisations (Art. 21 XXV).

One year after the proclamation of the Constitution, the National Congress approved Federal Law nº 7.805 which effectively regulated the constitutional article and its practical application. In doing so it extinguished the earlier requirement for Prospector Registration and substituted it by a document called Artisanal Mining Permission (Permissão de Lavra Garimpeira - PLG) which, although it could be issued to private individuals was actually preferentially directed at legally constituted artisanal mining cooperatives thereby instituting a new form of mining entity. The area that could be authorised for a private individual is limited to 50 hectares (125 acres) but there are no such restrictions for cooperatives. The law also makes a proviso that permissions for artisanal working of mineral deposits can only be issued if the operation has been previously licensed by the appropriate environmental authorities. Carrying out artisanal mining in a way that is damaging (predatory) to the environment may lead to the permission's being withdrawn and the activity suspended. Article 17 of the same law refers to the possibility of prospecting or artisanal mining in protected areas provided the environmental authority responsible for the administration of the protected area gives its formal consent.13 The legislation clearly states that no permission can be given for artisanal mining activities in indigenous reserves or in the frontier zone in which the activities of any mining company are subject to the prior approval of the National Security Council.

Decree Nº 98.812, dated January 9, 1990, expands the terms of the regulations governing artisanal mining, especially in regard to its impacts on the environment. The law attributes responsibility for any environmental damaged caused by the mining activity to the holder of the respective PLG and makes it clearer which

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13 “Article 17. Mining exploration and extraction in protected areas can only be undertaken with the prior authorization of the environmental authority administering the same. (Law 7,805 dated July 18, 1989).
governmental bodies are responsible for the procedures involved in obtaining an environmental license. It specifies the Brazilian Institute of the Environment and Renewable Natural Resources -IBAMA as the federal body responsible for analysing possible harm in the national sphere that may result from the issuing of a PLG and also specifies which body is environmentally responsible in terms of the State legislations in all other cases (usually the Department for the Environment of the respective state governments). When artisanal mining is carried out in urban areas, then the additional permission of the local municipal authority is also required. The DNPM can only issue a PLG when the environmental legislation in force has been complied with and the environmental license has been issued.\textsuperscript{14}

Any extraction of mineral resources without the appropriate license or concession of rights is classified as a crime punishable by from 3 months to 3 years of detention and a fine (Article 22) and the mineral product and all the machinery and equipment are liable to confiscation (Article 22 § 2).

A permission to carry out artisanal mining is valid for 5 years, but it can be renewed at the end of the period. The document issued by the DNPM is nominal, but the title can be transferred to the name of another person. If the title is held by a cooperative, the transferral can only take place if it has been duly authorised by a general assembly of the said cooperative. A cooperative that holds a PLG and wishes to engage in industrial extraction of the mineral has priority in the concession of the right to explore and exploit mineral deposits in the area where it is operational (Article 24).

In article 26, the regulatory Decree sets out a series of obligations to be undertaken by mining cooperatives that hold a PLG, such as: fostering and promoting compliance with work safety and environmental protection regulations; presentation of an annual report to the DNPM containing the names of all the cooperative’s members; and taking pains to ensure that persons other than those

\textsuperscript{14} The DNPM set out details concerning the granting of Artisanal Mining Permissions in a Decree issued on April 12, 2004
Belonging to the cooperative do not undertake prospector mining activities in their area.

The legislation also provides for the carrying out of artisanal mining in areas that have already been conceded for industrial mining provided there is a real technical and economic possibility of advantages for both mining regimes (PLG and mining concession). Should the holder of the concession object to the double regime of exploitation the DNPM will allow ninety days for it present an alternative project for the future extraction of minerals by the artisanal miners.

The Decree also conditions the creation or expansion of artisanal mining areas to the prior existence of a license issued by IBAMA based on a study of environmental impacts and an environmental impact report. The DNPM has the power to set up a special committee in the federal, state or municipal sphere charged with overseeing, orientating and controlling the technical aspects of mining activities in artisanal mining areas. Article 13 of that Decree provides for the participation of representatives of the artisanal mining concession holder to a seat on such committees.

The Artisanal Mining Statute, Law 11.685, was enacted on June 2, 2008. It modified the legal definition of artisanal mining in several ways. It goes beyond the original concept of an individual, self-employed worker and, in Article 4, recognises various modalities of working regimes such as autonomous individual labour, family-based working unit, individual worker in an established labour regime, partnership with a duly registered partnership contract, and associative forms of labour, especially cooperatives. Another innovation it introduced was opening up the possibility of working the tailings and remaining deposits of worked out mines. It also established the right of those artisanal miners that can prove their title to the area of origin of an extracted mineral to commercialise their production directly with the final consumer (Article 9). In regard to industrial-scale mining, the statute establishes the obligation to recuperate areas degraded by mining activities and to
comply with the work health and safety legislation. Those obligations are extended not only to small-scale miners and cooperatives but also cover persons working in partnerships with them. Holders of mineral rights deeds are required to supply the DNPM every year with a list of names of all miners working in the area they have title to.

Brazilian Mining Law concedes the right to a participation in the results of the mining activity to the proprietor of the land where the mining takes place and Article 20, § 1º, of the 1988 Federal Constitution institutes a tax to benefit states, municipalities, the Federal District and certain bodies of the federal administration under the heading of 'Financial Compensation for the Exploitation of Mineral Resources' (CFEM). The proportional participation in that benefit of the three spheres of government is: 65% for the producing municipality; 23% for the state, and 23% for the Federal Union (IBAMA, Ministry of Science and Technology, DNPM).

Because gold is eventually destined to become part of the financial market, it is taxed differently from other mineral products, which are all liable to payment of the CFEM. Because of its classification as a financial asset, the tribute on gold is levied by applying the tax on financial transactions (the IOF levied on credit, currency exchange and insurance transactions) and the aliquot adopted is 1% of its value. The tax collected under that guise is divided in the following way: 30% to the states and 70% to the municipality where the gold was first acquired in the form of a financial asset.

4. Artisanal mining techniques

Artisanal mining, like any other activity producing mineral products involves an extraction process divided into three stages, namely: prospecting, working the natural deposits and processing the material from the deposits. Since prospecting for gold in the Amazon first started, it has incorporated a series of working
methods and techniques. There now follows a presentation of the main methods currently in use.

The Deposits

Most of the gold extracted by artisanal miners in the Amazon region is of the secondary type, that is, it comes from primary gold deposits in the form of gold bearing veins of quartz rocks that have been exposed to weathering processes.

Gold that is removed from the rocks by exposure of the rocks to sun, rains and wind may accumulate in deposits near to the original rocks known as elluvium, or it may be transported by the waters to places far from its origins in which case it is called alluvium. Rivers in the Amazon basin are constantly changing their courses so that an alluvial deposit may come to cover the entire bed of a river valley. The gold bearing alluvium ends up being covered by layers of other sediments and organic material. The intensity of the sedimentation process and the time it took to form the deposit determines how deep the deposit lies in the earth. The gold content of the various alluvial deposits varies tremendously from mining area to mining area and even within a single mining area.

The alluvial deposits in Amapá are concentrated in the mining areas of Calssoene, and Tartarugalzinho, in the river basins of the Amaparí and Cupuxi.

Prospecting

The prospecting methods used are basically restricted to discovering secondary deposits that are not too deep in the ground. An area is appraised by testing for gold bearing gravels. During the ‘research’ (pesquisa) as the miners like to call it, holes one metre wide and one metre deep are dug. The material from the bottom is removed, washed and concentrated in a ‘pan’ or ‘batel’, a circular metal recipient in the form of a shallow basin or cone. According to the number of particles of gold found in the concentrated material, the prospector gets an idea of the richness or paucity of the deposits.
The factors that decide how much time and effort will be needed to extract the gold bearing material and how much that will cost, are the composition of the vegetation on the surface of the area, the depth of the water table and the depth of the gold bearing layer. With such information in hand, and based on the current price for gold, the prospector can make his decision whether to work it or not. If the prospecting is designed to open up a new mining area then the calculation will be made for the entire gully or depression and take into account the costs of the infrastructure needed to open up a bigger operation of that kind.

The first step to opening up a new working area is to cut down a clearing in the forest so that the miners can be supplied by small aircraft that throw down supplies to them from the air. If the mining area is accessible by road or river, obviously that does not apply.

Unless they are using machinery, gold diggers rarely work with deposits that are more than two metres underground. However the process of mechanisation that began in the seventies made it possible to work at greater depths. Discovering deposits at greater depths also depends on having machinery available to open up the deeper test holes. The time required to extract the gold bearing material from these larger test pits known as furações - borings (usually measuring half the size or a quarter of the size of what would be a normal working pit – 20 metres by 20 metres) makes it possible to estimate the feasibility of the work and make a decision on the opening or not of a new work front. Because the wave of mechanization has put a lot of deeper deposits within reach of the small miner, many of the areas formerly worked by hand have become the targets of renewed extraction, only this time with the use of machines and equipment. In these last cases, of course, there was no need for systematic survey. The distribution of the gold found in the gravel at the bottom of the first test pit (furação) is used as an indicator of the best direction in which to continue opening up the pit. Only if the results show that the deposits are not worthwhile extracting in economic terms is the pit abandoned and a new test pit opened up at some other spot in the area.
Artisanal miners do not have the resources needed to mine primary gold deposits, only the secondary alluvial ones. Primary deposits consist of gold embedded in quartz rock veins and are usually discovered when working alluvial or eluvial deposits. Prospecting for primary gold deposits is a risky business involving the sinking of mine shafts. That means high costs that have to be financed by the small miner himself and there is no guarantee that the results will be satisfactory because the quartz rock deposits that contain the gold are often not very thick and their direction and continuity are unpredictable.

**Working secondary deposits**

Working a secondary deposit without the use of machines begins with cutting down the vegetation cover (debreio) and clearing it from the area around the pit. Due to the large amount of work involved in cutting down big trees those with trunks over 20 cm in diameter are often left standing. The next step is to remove the overburden of unwanted soil and subsoil to get down to the deposits. That is done using pickaxes and shovels. The earth removed is deposited at the edge of the pit or if there is another worked out pit nearby it may be used to fill it up. The thickness of the overburden that needs to be removed varies greatly from place to place but usually, in this kind of unassisted manual work, it is not more than 2 metres.

After removal of the unwanted layers of organic material, soil, sand and clay, the underlying gold bearing gravel is removed. The layer may be as much as 50 cm thick. Because the flakes of free gold tend to accumulate at the very bottom of the gravel, which is usually lying on top of a layer of clay, it is usual to scrape the surface of the clay as well. The miners call this material *lagrese* and the origin of the term (*terre glaise*, French for clay) clearly shows the influence of the miners from French Guiana who introduced these simple mining techniques into artisanal gold mining in the Amazon region.

Apart from the shovels and picks, almost everything else involved in the mining is made with material available at the site of operations. One example is the hollow
trunks of the embaúba trees that are used as gutters to conduct water to where it is needed, and the big basin-shaped palm spathes that are used to bater água - (that is, early in the morning before the day's work begins, remove water that has built up in the pit from water table seepage or heavy rain). Another aspect that is highly variable is the number of miners needed to work the secondary deposits. It basically depends on the depth of the deposits being worked, the kind of material overlying it and the decisions of whoever is in charge of the extraction process.

The first pontoon dredges that appeared in gold working in the Amazon were simply engines mounted on rafts made from tree trunks or from empty oil drums lashed together. As time went by they became more sophisticated and began to be manufactured locally. Outboard motors were used to move them around. The engine mounted on top of the pontoon is coupled to a pump that operates a system to suck up the gold-bearing gravel from the beds of the rivers and streams. It also runs a compressor to supply air under pressure to the diver that operates the suction hose or pipe on the riverbed. The range of action of the diver below water is limited by the power of the motor and the suction it can generate. The most powerful engines (45 HP) give the diver a range of action of as much as 80 metres from the pontoon. According to the river being worked, the depths may be as much as 30 metres. The material brought up from the bed of the river is run over an inclined sluice with riffles in it to pre-concentrate the heavier gold-bearing materials.

To detect the spots that are worthwhile working, the diver goes down to the riverbed and guides the suction mouth to suck up material from different spots on the bed. The swift current in many of the rivers and the cloudy waters that make it impossible to see anything mean that the divers need to be highly skilful and experienced to work in this kind of exploration. Onboard the pontoon the material in the sluice box is sampled regularly and tested in the pan for the presence of gold. According to the results, the best spots are identified and the divers concentrate their efforts in those locations.
Unlike the simple working carried out without the use of machinery, where there is little differentiation in the work process, mechanised mining has divided up the process into various activities so that now there is not only a vertical division, insofar as one activity follows another, but there is also a horizontal division.

The process consists of various activities that need to be carried out simultaneously to ensure a successful outcome. In the case of the mechanised extraction of relatively recently formed, secondary deposits using pontoons and suction devices to bring them up from the beds of the rivers and streams, the following activities all take place at the same time: 1) manipulation of the suction hose or pipe on the bottom of the river or stream; 2) supervision of the engine, pump and compressor on the pontoon; 3) supervision of the sluice box, periodic assessment of the material being brought up and removal of the larger stones or pebbles that may be disturbing the flow of material down the sluice. That means that at least three individuals are needed to run a suction pontoon. The general practice is to have a team of four that take turns in the diving, spending two hours under water at a time, making up an eight-hour working day. If the pontoon is working in an area where there is a high gold content in the deposits, then it is quite common to have three teams working an eight hour shift each and keeping the operation going 24 hours a day. The high level of production achieved by pontoons meant that this extraction technique was quickly disseminated to practically all the gold mining areas in the Amazon and very soon the main riverbed deposits were worked out. That led to a more intense search for secondary deposits on land in the 1980s and the spread of mechanised working away from the rivers and streams.

The land system, known as par de máquina (twin machines) consists of a water cannon and a suction device. Working these land deposits usually involves clearing the vegetation from the area to be worked, which is done using chain saws to fell the larger trees, and some bigger operations even use bulldozers. Once the trees have been felled the rest of the vegetation is piled up and burned and then the work of removing topsoil and overburden is begun, using high pressure water cannons that can be directed at will to mobilise the material. The water washes
down the overburden of soil sand and clay forming a sludge that runs into a hole especially dug to receive it and from there is removed by a suction hose known as a maraca. From the hole the sludge is sucked out and goes on to be concentrated in sluice installed beside the pit.

The division of labour in the twin machine operation involves the following simultaneous activities: manipulation of the water cannon; supervision of the suction pump engine and the suction hose; removal of the surface layers of organic material covering the overburden to be removed; and the supervision of the water pump that is usually installed outside the pit near to a river or other body of water from which the water is taken. As the same individual responsible for removing the organic material can undertake this last activity, the minimum number of crew to operate a twin-engine system is three. Often, however, the crews consist of four or five persons because, if the engine driving the water pump is powerful enough, it can be coupled to two water cannons so that two individuals will be occupied in washing down the walls of the pit at the same time.

Just like the pontoons, the twin-engine systems proved themselves capable of greatly increasing gold production, especially when working the same kind of shallow deposits that were traditionally worked by hand. An example of that was the gold mining area of Araguari in the state of Amapá, where the twin-engine system was introduced in 1981. It raised gold production for the area to 2 kilograms a month, whereas formerly, under the manual regime, production was a mere 500 grams a month, on average (DNPM / CPRM 1981).

**Working Primary Gold Deposits**

The exploitation of primary gold deposits in the Amazon has always begun almost accidentally, with prospectors discovering them during the process of working alluvial (secondary) deposits. That is because most artisanal prospectors lack the technical knowledge about such mineral deposits that would enable them to actively prospect for them.
When they are discovered, they are usually worked in the following way: if the quartz vein is exposed on the surface then the overburden is removed and according to the nature of the rocks a decision is made as to what is the best method to extract the gold-bearing rocks (water cannon, pickaxe, bulldozer, hydraulic hammer, or explosives). Once the rock has been broken up, the fragments are removed from the pit to be processed. Depending on the nature of the mining operation, the removal may be done using wheelbarrows or a conveyor belt, hoists, cranes or trucks.

The other way of extracting primary gold deposits is by underground mining and in the state of Amapá that is done in Lourenço and Vila Nova. The primary deposits are usually found near to secondary deposits and indeed the latter are often an indication of the existence of gold-bearing quartz veins somewhere nearby. The first step in underground workings is to sink a shaft usually a metre to a metre and a half wide. It is dug down until it hits the layer of gold-bearing gravel or rock. It may be dug with rudimentary tools like shovels and pickaxes or with the assistance of hydraulic hammers and explosives. According to the nature of the material the shaft is penetrating, and the sense of responsibility of whoever is in charge, the shaft walls may be lined with planks to avoid any collapse. Once it gets down to the gold-bearing material the miners will attempt to follow the vein of rock or layer of gravel into the earth by digging horizontal tunnels or galleries that will enable them to remove it.

The same tools and equipment are used to open the galleries as are used to sink the main shaft. The material is taken to the foot of the shaft to be hauled up to the surface in buckets or if the mine is a bigger operation and has capital available there may be a system of electric hoists, winches or even conveyor belts to remove it. The depth of the mine depends on local geology (depth of the deposits and the gold content of the rocks or gravels). Gold miners working at Lourenço report that there are some mine shafts that go down to depths of 200 metres.

Another form of working is by opening horizontal galleries on the slopes of hills or mountains where it is believed that there are gold-bearing rocks. Once a vein has
been discovered, the miners will follow its course, digging further and further into the mountainside.

Processing

Over recent years the methods for working mineral deposits used by gold prospectors in the Amazon region have come to increasingly resemble those used by small and medium-sized industrial mining companies, but the methods used to process the material and extract the gold itself are very different from the industrial processes, which employ a range of technologies according to size of the deposits and the gold content of the material. Prospectors use just two simple techniques, one is gravimetric and the other depends on forming mercury amalgams to obtain the final product in metal form that can be sold. We will now describe separately the main methods used to process the raw material in the case of secondary and primary gold deposits respectively.

There is a difference between the way the material obtained from secondary deposits is processed in manual working and the way it is handled in mechanised workings. When machines are being used, the processing has to be done at the site of extraction and at the same time as it is going on because the material cannot be stored. In manual working that is not the case. Working the deposits and removing them is one procedure and processing them to get at the gold is another.

The first step, in either case, is to mix the gold-bearing material with water to form a slurry (polpa is the local term). The diluted slurry is then run down a system of sluices to separate the gold using the force of gravity. The angle of the sluice and its dimensions are determined by the granularity of the gold that is to be separated.

The main sluice used for this is called a cobra fumando (smoking snake) and is made of wood and set at an angle of 45º at which it will only be capable of retaining the grosser grains of gold. Another wooden sluice called a dalla is designed to trap the finer grains or flakes of the metal as the material washes down it. It is usually set at a much shallower angle of 20º. Both sluices are about 50
cm wide. The cobra fumando is a mere 2 metres long but the dalla can be as much as 5 metres long. On the floor of the sluice a series of wooden crossbars or riffles (taliscas) is fixed to disturb the even flow of the material down the sluice and capture and concentrate the denser materials, while the lighter ones run on over them. To enhance the sluice’s efficiency in capturing gold particles, the floor is lined with sacking or carpet to which the tiny flakes of gold can adhere. Mercury can be added to the dalla on the upper side of the cross bars where it remains in spite of the flow of materials over the taliscas.

After a certain amount of slurry has been processed in this way, the material trapped above each talisca is removed and placed in a batel or pan (batéia) a metal disc shaped like a very shallow cone or a basin with a rounded bottom, where the denser materials are further concentrated and mercury is added to ensure the full capture of any gold present. The material that has adhered to the sacking or carpet is also removed and treated in the same way. The gold-mercury amalgam that forms in the batel or pan is squeezed out in a cloth to recuperate any free mercury for further use and the amalgam is then heated in the open air to evaporate the mercury and obtain the pure gold.

In mechanised mining, the processing is done in two stages. First the sludge is sucked up by the suction hose and it too goes to concentrating box and then on to the cobra fumando sluice. The concentrating box is just like the sluice only much bigger because of the greater volume of material to be processed, pumped in by the machine. It is usually from 1.2 to 2 metres wide and may be up to 9 metres long.

The concentration sluices mounted on the pontoons in the rivers are even larger as they have to handle much more material and they may occupy the entire width of the pontoon. To cut down the speed of the slurry gushing up from below it is discharged into a funnel shaped box before passing on to the sluices. They too are floored with carpet or jute sacking material held down by very fine mesh wire
screens all designed to trap the gold particles as the material passes on down the sluice. The transverse riffles set in the sluice have the same function. After the material has run down the sluice it is discharged directly into the river behind the pontoon forming large sandbanks the miners call *arroto* (belches).

Removing the accumulated material and cleaning out the concentrating box (*despescagem*) takes place at least twice during the working of a pit: after the overburden has been removed, and after the gold bearing gravel has been worked through the sluices. If the deposit is very rich in gold then the procedure may be carried out more frequently. The pre-concentrates in the box and the materials concentrated in the sluices are handled in the same way as in manual artisanal mining and end up in the *batel* or pan to which mercury is added to capture the gold in the form of amalgam.

Processing material containing primary gold deposits is more demanding, as the mineral material has to be laboriously prepared. The gold is not free in the form of grains and flakes as it is in secondary deposits but embedded in the rock. The first stage then is to break the rocks down to the smallest possible size. That is done using hammers or pounders, or hammer mills, or ball mills powered by a diesel engine. The crushed material is then mixed with water and ground even finer until the particles are the size of a grain of fine sand. The mixture of finely crushed rock and water coming out of the mills is then passed through a sluice system to obtain a partially concentrated mixture. In the first part of the sluice system the mixture passes down a step forming a tiny waterfall and at the bottom of the step where the mixture is turbulent, mercury is placed to catch the gold that comes into contact and form amalgam. The mixture that goes on from there flows over the first part of the sluice box which has a copper plate with mercury on it designed to capture any fine gold passing over it. The next part is floored with carpet material or jute sacking held down by fine mesh wire screen. The cleaning out of the concentrated material at intervals follows the same procedures as in the case of the *cobra fumando* sluice except for the section with the copper plate, which is scraped to remove the amalgam that has accumulated on its surface. Once more
the concentrated material is worked in the batel or pan to concentrate the gold in
the centre and then the gold is treated with mercury. The amalgam is burned to
vaporise the mercury and leave only pure gold behind.

The techniques described above are applied in virgin areas that are being worked
for the first time. Their poor efficiency means that only half of the gold in a given
deposit is actually extracted so that the tailings left over after working the deposits
may still have enough gold in them to justify re-working them, especially when it is
borne in mind that the artisanal miner who does so will not have the work and
expense of prospecting for deposits and removing all the overlying material. In the
case of the sandbanks that form behind the suction dredges, the work can be done
manually. Another factor that determines whether that activity is worthwhile or
not, is the market price of gold. If it is high enough, it may justify re-working
material that was formerly considered worthless because of its low gold content.
Because the virgin areas have gradually been worked out, the re-working of
tailings has been an important source of production in the recent history of
artisanal mining in the Amazon.

5. Social actors in artisanal and small-scale mining
Artisanal mining involves the extraction of minerals from the land and so the
proprietor of the land where it is carried out is automatically one of the main
actors in the artisanal mining scenario. Land ownership is based on holding title or
deeds or when the land has no private owner but belongs to the Federal Union,
ownership is an informally acknowledged right attributed to whoever discovered
the gold bearing area, or it may be based on an informal transaction of sale and
purchase. When no formal title to the land exists then the condition of ‘owner’ is
conditioned to the individual’s capacity to assert his ownership and exclude others
from the use of it.

An entirely different question is that of ownership of the means of production and
whoever occupies that position is another important actor on the capital side of
extracting mineral wealth. The owner of the means of production is always the one
that organises the process, whether it be a simple manual activity or one that involves complex equipment like a dredge worth several kilos of gold.

A third agent involved in the process, also on the capital side, is the supplier or trader who invests in gold prospecting and exploration.

In addition to the workers that take part directly in the extraction of the mineral or in the supporting activities, the artisanal gold workings are the focus of whole contingents of people whose livelihoods depend in one way or another on the income created by gold mining. These last are socially and economically organised in an entirely different manner from those that work directly in the extraction of the mineral.¹⁵

There now follows an account of how the working regime is perceived by those involved in it inside the mining areas. The owners of the machinery and equipment and the workers themselves both refer to the working regime to exploits deposits in the mining areas as a form of partnership. It is an informal agreement that begins with the breaking down of the workface and ends with the despescagem or final extraction of the gold itself¹⁶. The worker contributes his labour and the owner of the equipment contributes the means of production as well as taking responsibility for the costs involved, including food for the workers¹⁷. Each side receives a pre-established proportion of the final results in the form of the extracted gold (70: 30). After the results have been fairly divided, both sides are at liberty to renew the partnership or not. Both sides are fully aware of those rules and nobody questions them.

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¹⁵ Under this heading come all those engaged in leisure and entertainment activities inside the gold working areas.

¹⁶ Despescagem in the miners’ language means the final separation of the pure gold.

¹⁷ The partnership relationship is established between the worker and the owner of the equipment and machinery so that the worker has nothing to do with the proprietor of the land itself who only deals with the machinery owner and may charge him a tax for the use of the land or oblige him to purchase all supplies from the land proprietor at monopoly prices. In some cases where the only purpose of the propriety of the land is to produce gold then the proprietor may be the landowner and the machinery owner and control the entire operation.
The great acceptance of this form of partnership is due to the fact that both the owner of the equipment and the individual worker see clear advantages to themselves in it. On the part of the worker, he sees himself involved in a direct partnership with the owner of the equipment, not with his fellow workers; and, that in a subjective vision frees him from the condition of mere employee and puts him on the same level as the owner. That feeling of equality is reinforced by the fact that inside the mining area both worker and machinery owner subject themselves to the same working and living conditions\(^{18}\) and very often they come from the same social background. The fact that the worker has a direct participation in the eventual product of all the work done to extract the mineral is another stabilising factor: the eternal hope of striking out, that is to say, of finding a very rich deposit that will multiply their earnings, sometimes to the point of enabling a worker to become a machinery owner\(^{19}\).

Another angle that enables us to understand the wide acceptance of the partnership arrangement is the change for the better it brought about in relation to another work regime that has always been common in extractive activities in the Amazon, the system of creating worker indebtedness by advancing provisions or other goods for the extractive venture (Company store debt) known as *aviamento*. The ‘half and half’ partnership arrangement is fundamentally different from it in several aspects, such as the way the price of the gold is determined; it is perfectly transparent and comprehensible to the gold worker, which was never the case with the rubber tappers and the price of rubber. There is very little possibility of deceiving the gold worker when payment is being made especially when it is made in actual gold. In the *'aviamento'* system there was no way the rubber tapper could ever improve his social position or progress. In the partnership arrangement of small-scale gold mining, the worker is never permanently in debt to the owner of the equipment or proprietor of the land and that enhances his mobility, whereas

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\(^{18}\) It is important to note that the living conditions of the mine proprietor are very different from those of the owner of the machinery and equipment especially if the latter only has one or two machines.

\(^{19}\) This passage from being a worker to being a machine owner is just one side of the coin. The other is when the owner of the machines goes bust and reverts to being a worker, showing that prospecting is a high-risk activity.
in *aviamento* the permanent indebtedness of the worker was the lynch pin of the whole system\(^{20}\).

While it is true that the way non-industrial gold mining is organised today, the labour relations are typical of a capitalist system, the regime actually disguises the fact by creating an illusion of equality between capital and labour and thereby avoids the worker’s identifying himself with a labour category or class and even suggests the attractive possibility of social ascension, all of which are positive features in comparison with the old ‘company store’ type of subjection by debt.

6. **Industrial mining in the state of Amapá today**

At the end of 2010, there were only two large industrial mining operations in activity in the state of Amapá:

- Caulim da Amazônia – CADAM (Amazon Kaolin), mining kaolin in the municipality of Laranjal do Jari
- Anglo Ferrous Amapá, mining iron ore in the municipality of Pedra Branca do Amaparí

Another three have stopped production operations, at least temporarily, and since the end of 2010 none of them has renewed them:

- Projeto Tucano, gold mining in the municipality of Pedra Branca de Amaparí but paralysed pending new exploration and testing to define the size of deposits and the best methods to extract and process the mineral material.
- Mineração Vila Nova – mining chromite (chromium ore) and iron ore in the municipality of Mazagão, with operations paralysed because the superficial deposits of chromite have all been worked out. The company is currently investigating the possibility of underground mining for chromite and the feasibility of exploiting the iron ore deposits that occur in its concession area.

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\(^{20}\) Worker mobility is further enhanced by the fact that the machine owner is responsible for supplying food so the worker is freed of the need to settle long enough to cultivate an area that would guarantee his subsistence in terms of food supply.
Unagem Mineração – mining iron ore in the municipality of Mazagão, with operations suspended because of the low price of ore and problems related to the logistics of transporting the ore.

The situation of the industrial mining sector is best reflected in the volume of its tax contributions to the state government. In 2008 and 2009 they remained stable but increased considerably in 2010 when the CFEM (financial compensation for mineral extraction) paid by the companies amounted to around 12 million Brazilian reals. That increase was partly due to an increase in the price of iron ore and an increase in the production of the Anglo Ferrous company.

Table 1: Mining Tax -CFEM levied in the State of Amapá - 2008-2010 by substance [in R$]

<table>
<thead>
<tr>
<th>Substance</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold ore</td>
<td>7,235.61</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gold</td>
<td>1,255,029.42</td>
<td>734,624.71</td>
<td>180,258.00</td>
</tr>
<tr>
<td>Native Gold</td>
<td></td>
<td>35,958.35</td>
<td></td>
</tr>
<tr>
<td>Kaolin</td>
<td>3,765,234.40</td>
<td>2,785,276.36</td>
<td>2,117,696.61</td>
</tr>
<tr>
<td>Iron ore</td>
<td>1,718,683.67</td>
<td>4,147,359.59</td>
<td>9,429,157.47</td>
</tr>
<tr>
<td>Other substances</td>
<td>728,730.80</td>
<td>167,175.46</td>
<td>261,584.34</td>
</tr>
<tr>
<td>TOTAL</td>
<td>7,467,678.29</td>
<td>7,834,436.12</td>
<td>12,031,890.38</td>
</tr>
</tbody>
</table>

Source: DNPM

The geographic concentration of industrial mining means that the distribution of the CFEM tax levied is practically restricted to two of the eleven municipalities entitled to a share of the compensation: Pedra Branca do Amapari and Vitória do Jari, which received 97.5% of them in the period from 2008 to 2010.
7. Artisanal and small scale mining in the state of Amapá today

The diagnosis of mining activities in the State of Amapá for the year 2010 identifies eight sites of artisanal mining activities distributed among three regions: Lourenço, Vila Nova and Araguari.

The Lourenço area

About 2,500 people live in the Lourenço township which functions as a kind of support base for the gold working activities. Most of the work today is concentrated on re-working tailings left by previous mining activities conducted either by the Mineração Novo Astro Company which was in activity in the region up until 1995, or the tailings left by artisanal miners themselves. Ever since the underground mining of primary gold ceased and the mine was sealed off at Morro de Salamangone due to the flooding of the underground galleries, primary gold mining has been carried out by some artisanal miners that have sunk their own shafts in the area around the mine. Apart from that there are several sites where secondary gold deposits are being worked, either with water jet techniques or with the use of machinery like front-end loaders and big ore trucks.
However, no official information is available on annual gold production from the Lourenço mining area. According to the board of directors of the miners’ cooperative COOGAL, 153 kg of gold were produced there in 2008. That figure however only refers to the production registered with the cooperative and does not include gold produced by artisanal miners that are not members of the cooperative or members that preferred not to register their production. It is estimated that annual production from the Lourenço area stands at around 200 kg.

The Gaivota area
Artisanal mining in the Gaivota area is located on both banks of the Vila Nova river which marks the division between the municipalities of Mazagão and Porto Grande. The mining area is accessible by a 27 km long road linking it to Distrito de Cupixi (Calha Norte). Artisanal mining has been going on there since 1970 and a small township has sprung up nearby with about 370 inhabitants (DSM-AP 2010).

Extraction of alluvial gold originally began in the ravines and creeks that flow into the Vila Nova River but later developed to explore and extract primary gold deposits either through shafts and underground workings or by removing the overburden when the sandy nature of the soils and sub-soils made it unfeasible to sink shafts and construct galleries. In the 1990s, a mining company obtained a concession to the rights of part of the area (Mineração Água Boa). After a few years it ceased its activities but failed to recuperate the degraded area alleging that doing so would lead to an invasion of artisanal miners. However some miners did start work there again after the company withdrew.

There have been conflicts in recent years involving prospectors and another mining company (Amapari Mineração) that holds the mining rights to an area of artisanal mining activities. After an intervention ordered by the Federal Courts of Justice a prospectors cooperative (Cooperativa dos Garimpos do Vila Nova –

21 The COOGAL cooperative registers the weights of its members’ production at the moment the gold is smelted, which is done in purpose-built installations.
COOPGAVIN) was awarded the right to work in an area of 480 hectares that was
dismembered from the company's concession for that purpose.

There are about 20 groups prospecting in the Gaivota area and their annual
production is believed to be around 50 kg of gold.

**Gold workings in the Amapari river region**
The Amapari river gold miners are working on the right bank tributaries of the
river in the lands belonging to the municipalities of Serra do Navio and Pedra
Branca. Activities are limited to (alluvial) deposits of secondary gold. According to
the Mineral Sector Diagnosis, only three locations are actually producing in the
area (Porto Panel, Village Antônio, Castanheiro). 26 artisanal miners are working
in 10 spots and annual production is estimated at 10 kg.

**Capivara gold workings**
The Capivara workings are located on a small river with the same name that flows
into the Araguari River. They can only be got to by river. The material being
worked there is both alluvial and colluvial (foot of slopes) as well as some primary
deposits in rocks.

Work at the two main areas of workings in the region (Capivara and Batata) was
placed under interdiction by a joint o action of the Federal Police, IBAMA, the
ICMBio and the DNPM because the Capivara workings were situated inside the
limits of the Amapá National Forest, a protected area, and the Batata workings in
the buffer zone around the same protected area.

**The Tartarugalzinho small-scale gold workings**
The Tartarugalzinho workings are located in the urban area of the municipal
centre of Tartarugalzinho. Although they have been inactive for several years they
currently belong to the mining company Beadell Resources which has carried out
prospecting and exploration and identified a reserve of 2 tons of gold there, at
depths of as much as 120 metres.

In the area around the municipal centre there was another gold working spot
known as Buzina but it was closed down by a joint action conducted by the Federal
Police, IBAMA, and ICMBio, although the reasons for doing so have never been very clear (DSM-AP 2010).

**Gold workings in the region of the upper Cupuxi River**

Artisanal gold mining in the upper Cupuxi reached its height in the 1980s but it became illegal when the National Reserve of Copper and Associated Minerals - RENCA was created in 1984 and with the creation of the Iratapuru protected areas. The latter took place in 2005 under the auspices of the Amapá government’s Department for the Environment – SEMA/AP and it led to the interdiction of all the 5 gold workings in activity at the time.

**Oiapoque Gold Workings**

With the creation of the Tumucumaque Mountains National Park in 2002, all the old gold working areas in the Oiapoque region were extinguished. Formerly the activity was almost entirely directed at sediments on the riverbeds and extraction was done using suction dredges mounted on pontoons.

Closing down all mining activities in the Oiapoque region led to a mass migration of gold miners into the territories of French Guiana.

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8. **Economic gains and losses stemming from artisanal gold mining in the State of Amapá**

The data gathered by a Diagnosis of the Mineral Sector undertaken by the government of Amapá state makes it feasible to assess the economic importance of artisanal gold mining activities. Based on the figures for 2008 (when the average price of gold was 42 Brazilian reals a gram) the value of total gold production was around 9 million reals. About 500 individuals were involved in the activity and their average monthly income was around 500 reals. The biggest producing area was Lourenço, responsible for over two thirds of total production.
Tabela 3: Artisanal Gold Workings in Amapá – production value, number of miners and per capita income [2008]

<table>
<thead>
<tr>
<th>Region</th>
<th>Local production (R$)</th>
<th>Number of miners</th>
<th>Monthly per capita income (R$)</th>
</tr>
</thead>
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<tr>
<td>Calssøene</td>
<td>6,451,200.00R$</td>
<td>370</td>
<td>435.00R$</td>
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<tr>
<td>Vila Nova</td>
<td>1,461,600.00R$</td>
<td>97</td>
<td>376.00R$</td>
</tr>
<tr>
<td>Araguari</td>
<td>443,520.00R$</td>
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<td>583.00R$</td>
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<tr>
<td>Amapari</td>
<td>443,520.00R$</td>
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<td>Oiapoque</td>
<td>227,808.00R$</td>
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<td>406.00R$</td>
</tr>
<tr>
<td>Total</td>
<td>9,027,648.00R$</td>
<td>516</td>
<td>498.60R$</td>
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</tbody>
</table>

Source: DSM-AP, 2010: 90

The table below sets out information on the most visible environmental impacts of the activity – deforestation and degradation of land and vegetation in general. Any assessment of the complete environmental cost of gold working carried out on a non-industrial scale would have to take into account environmental damage resulting from effluents (diesel fuel, oil, detergents) discharged into the streams and rivers, the damage caused by mercury metal (liquid) and vapour, the damage to aquatic systems (siling up, destruction of the fauna and the flora in the rivers) and direct damage resulting from human presence (reduction of the fauna through hunting, production of solid waste deposited in the environment etc.).

Table 4: Area suffering impacts from artisanal gold mining activities in the state of Amapá [2010]

<table>
<thead>
<tr>
<th>Mining area</th>
<th>Area affected (hectares)</th>
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<tr>
<td>Lourenço</td>
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<td>Gaivota (Vila Nova)</td>
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<td>Tartarugalzinho</td>
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<td>Others</td>
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<tr>
<td>Total</td>
<td>887.00</td>
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9. Gold workings and Protected Areas

The legislation governing protected areas foresees two situations in regard to the use of mineral resources that lie within their boundaries. In protected areas under the regime of Integral Protection (Parks, Ecological Stations, Biological Reserves, Natural Monuments, and Wildlife Refuges) no form of mining activity is permitted.

In Protected Areas under the regime of Sustainable Use, the possibility of any mineral extraction being permitted depends on the category of management they come under: 1) in Extractive Reserves it is forbidden; 2) in Environmental Protection Areas it depends on the Ecological Zoning Plan determined for the area and the authorization of the body responsible for administering the area; 3) and in Sustainable Use Reserves and National Forests, there is no legal definition respecting it and some consider that it is forbidden while others feel that it is permitted. What has been seen in practice is that it is usually forbidden in Sustainable Use reserves and sometimes allowed in National Forests (Isa, 2006).

The maps included in the attachments demonstrate the spatial demands of the mineral sector in Amapá state and in the north of Pará state and how they overlap the limits of the protected Areas. All the information is based on DNPM data (April 2011) The maps produced were as follows: (1) Requests for Mineral Exploration Licenses, (2) Requests for Mining Permissions, (3) Requests for Artisanal Mining Permissions, (4) Artisanal Mining Licenses, (5) Mining Concessions, (6) Exploration Authorizations.

The tables below show the situation in detail, by municipalities, in the States of Amapá and Pará.
Table 5: Municipalities in Amapá State where there are Federal or State Protected Areas and their status regarding use for mining

<table>
<thead>
<tr>
<th>Nº</th>
<th>MUNICIPALITY</th>
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Source: ISA (2011)
### Tabela 6: Municipalities in Pará State where there are Federal or State Protected Areas and their status regarding use for mining.

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<th>Nº</th>
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<td><strong>71</strong></td>
<td><strong>131</strong></td>
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Source: SEMA (2011); ISA (2011)
10. The dynamics of the present situation

The current situation of gold working in the state of Amapá and the north of the state of Pará is influenced by the dynamics of several distinct factors that will be described one by one and then in the light of their interaction and interdependency, namely:

- Fluctuation in the price of gold;
- Repressive actions directed at artisanal miners in activity in Brazilian protected areas;
- Repressive actions directed at Brazilian artisanal miners in activity in French Guiana;
- Institutional conflicts among bodies of the Brazilian federal government regarding the treatment of the issue of mineral workings in areas under environmental protection;
- New initiatives attempting to modify the legal framework regulating the issue of artisanal mining activities;
- Changes in the political composition of the governments of the states of Amapá and Pará;
- Administrative decisions that may be indicative of a change in the attitudes and behaviour of institutions.

Fluctuations in the price of gold

The price of gold on the international market is about to hit an all time high of USD1,500 an ounce (troy). In that respect it has been accompanying an overall tendency to increase in the prices of mineral commodities in general, partly fuelled by the strong demand from the Chinese market. Unlike those mineral commodities destined exclusively for industrial use, however, gold has always been seen as a safe financial asset in times of financial crisis and accordingly its price has recovered remarkably fast from the effects of the 2008/2009 global financial crisis. An analysis of gold prices in the international market over the last ten years shows an increase of 500%. On the Brazilian market it never got up to that level and the figure is around 320%. However more modest it might seem, the increase it represented in Brazilian Reals was sufficient to offset the increasing cost of
material used in gold mining activities (fuel, food, machinery), over the same period. In that sense, the steady increase in gold prices was an important factor of support and helped to make the gold mining activities remain feasible in spite of a series of adverse external factors.

Graph 1: Gold Prices 2002-2011 [R$/g, USD/oz]

Repressive actions taken against artisanal gold miners in Protected Areas in Brazil

The last two years have witnessed a series of repressive actions unleashed: (1) to remove and punish artisanal miners found working inside the limits of protected areas; and (2) to impede Brazilian artisanal miners from working inside French Guiana. The actions unfolded in Protected Areas are sporadic and often set in motion because of denunciations received; those designed to prevent Brazilian artisanal miners from entering French Guiana to work are more consistent and constant and they are largely in the hands of the Brazilian Army patrolling the Oiapoque river.
The actions of the Army in the Oiopoque have the legal support of Complementary Law nº. 117, dated September 2, 2004, which authorises the armed forces to take repressive action in frontier areas to curb environmental and trans-border infractions\(^{22}\). Accordingly, the army set up a post at a spot called Grande Roche, where it controls all river traffic going downstream. The object of this surveillance and inspection is to curb the transportation of supplies, especially food and diesel, to the gold mining areas situated inside French Guiana. The situation led to a legal action moved by residents of Vila Brasil and Ilha Bela, two townships upstream from Grande Roche and inside the area of what is now the Tumucumaque National park, whereby the demanded their fundamental right to come and go. The Federal Court of Justice issued a restraining order but without questioning the legality of the Brazilian Army’s actions. It established standards regarding the quantities of foodstuffs that could be considered as consistent with the communities’ own food consumption and that would be allowed to pass.

There now follows a list of all the repressive actions unfolded inside protected areas in the state of Amapá and in the northern part of the state of Pará in 2009 and 2010.

January 2009 – Operation Poraquê (Electric Eel)

On January 23, 2009, the ICMbio with the support of the Federal Police and the Military Police of the Brazilian Army seized a generator plant in Ilha Bela that supplied electricity to the community living on the island. The owner of the plant, José Francisco da Silva, was fined 873,158.40 Brazilian reals for keeping a generator in the place. In November of 2008 he had been notified of the illegality of his presence in a protected area (Tumucumaque Mountains National Park) and given 60 days to leave the area. The machinery was confiscated and taken by helicopter to Oiapoque (ICMBio 2009).

\(^{22}\) Article 2 of the same law determines that “the Army’s shall carry out other relevant actions and it shall have the following subsidiary incumbencies in particular: IV – act against trans-frontier and environmental crimes by means of preventive actions and repressive actions together with other bodies of the Executive branch or alone, carrying out: a) patrols; b) searches of individuals, land transport vehicles, boats and aircraft; e c) arresting those caught in flagrante delecto.”
May 2009 – Operation Symbiosis II

The aim of the action, which took place in the period from May 15 to 26, with the support of the Army and the Federal Police, was to inspect and control traffic on the Oiapoque river and exercise control over the communities of Ilha Bela and Vila Brasil, located inside the limits of the Tumucumaque Mountains National Park. According to the Federal Police report 1,100 litres of diesel, as well as weapons and mining equipment were found and seized (Folha de São Paulo May 25, 2009).

July 2009 – Capivara Gold workings

According to the statement made by the ICMBio representative at a Public Hearing before the Standing Committee for the Environment and Sustainable Development of the Brazilian House of Representatives, (Brazil 2009) the gold workings located inside the limits of the Amapá National Park, created in 1989, continued in activity even after they had been included inside the limits of that protected Area. In 2008, ICMBio proposed an agreement whereby the artisanal miners would leave the area and environmental degradation would cease. One year later, ICMBio officials confirmed that the agreement was not being respected and initiated a series of repressive actions against the artisanal miners. On June 6, 2009, they were served formal legal notice to quit the place within 45 days. The ICMBio representative did not say how many miners were involved, but a news item in the publication Globo Amazônia of September 12, 2009 said there were 15 individuals in the area. On October 18, a team made up of Federal Police officers and IBAMA officials destroyed six engines that they found at the site of the workings. At the same Public Hearings, a representative of the Capivara Valley Artisanal miners complained about the destruction of private property by government employees and justified the continued presence of some artisanal miners in the area because, there were no other alternatives for exercising the activity, which was their livelihood and means of subsistence. The Capivara Goldworkings Cooperative appealed against the ICMBio’s decision in the Federal Courts in the State of Amapá and on April 26, 2010, the Court handed down a decision in favour of the Cooperative’s re-establishing the artisanal miners’ right to tenure and at the same time the right to work the mineral in that area. Furthermore, the court demanded
action on the part of the public authorities to promote improvements in the social and economic situation of the miners (Portal Amazônia - Rede Globo April 27, 2010). The Office of the Attorney General of the Federal Union (AGU) in alliance with the Regional Federal Public Prosecutor for the 1st region and the Office of the Federal Public Prosecutor in Amapá and the Specialised Public Prosecutor’s Office filed an appeal against the sentence alleging the environmental damage that renewal of gold working activities would incur as well as alleging the technical inadequacy of the original legal process in its failure to prove that the artisanal miners were occupying the area before the creation of the National Forest protected area. The Courts of the 1st Region decided in favour of this latter action and duly suspended the effect of the decision favouring the artisanal miners until such time as the final judgement were pronounced on the action moved by the AGU.

March 2010
On March 10, 2010, the Gendarmerie of French Guiana arrested 5 Brazilian artisanal miners and seized two boats during a patrol of the Oiapoque river. The miners were left on a rock in the middle of the river where they were rescued by their colleagues who also managed to get back one of the boats from the gendarmes. (R7 Notícias March 11, 2010).

April 2010 – Operation Curare
In the middle of April 2010, a joint action of the Brazilian army and IBAMA led to the arrest of nine artisanal miners working inside the limits of a protected area on the border between Brazil and French Guiana in an area belonging to the municipalities of Almerin and Oiapoque. They were taken to Santarém and then transferred to the Agricultural penitentiary of Cururunã. They stated that they were unaware of the existence of the Protected Area (Jornal Folha do Progresso March 25, 2010).
Repressive actions against Brazilian artisanal miners working inside French Guiana

It has been estimated that as many as 10,000 Brazilian artisanal miners are working illegally inside French Guiana’s territory producing around 10 tons of gold a year. Ever since President Sarkozy’s visit to French Guiana in February 2008, the French government has been intensifying its efforts to curb the gold mining activities of Brazilian artisanal miners in French territory. The actions carried out, apart from the patrols on the Oiapoque River, involve raids on mine workings and *currutelas* in which the mining equipment and supplies are destroyed or confiscated. The arrested miners are being taken to Oiapoque and in cases where they are second time offenders; a formal extradition process is opened. In spite of the regular raids of the French authorities, the number of Brazilian artisanal miners inside French Guiana seems to have remained fairly stable over the last two years, showing the ineffectiveness of the repression and the efficacy of the resistance strategies employed by the artisanal miners, like getting away before the raids, or moving on to open up new areas and workings. In 2008 some success was achieved in the battle to suppress prospecting and mining on the Sikini River. The Brazilian miners working that tributary of the Oiapoque River were forced to retire to the Brazilian side and they ended up settling on the Ilha Belo Island situated in front of the mouth of the Sikini. The population of Ilha Bela, which was a mere 164 individuals in 2006, had jumped up to 2,000 by 2008. From then until now that settlement has figured as the main supply centre for the mineral working areas inside French Guiana.

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23 The Brazilian Ministry of Foreign Affairs, Itamaraty estimates that there are 20,000 Brazilians living illegally in French Guiana and that half of them work in artisanal mining activities.

24 The French Authorities base their actions on the provisions of the Law governing the immigration and residence of foreigners, which has been in force since 2005 but only rigorously enforced since 2007. Verbal statement made by Luiza Lopes da Silva, Head of the Consular Assistance Division of the Ministry of Foreign Affairs during a public hearing (Brasil 2010).

25 See recent material published in national and international newspapers registering the illegal activities of Brazilian prospectors in French Guiana’s territory (Tabor 2010), (Tabor 2011).
Inter-institutional conflicts among federal government bodies over policy on artisanal mining in protected areas

Law 9.985 /2000, which establishes the National Protected Areas System, divides protected areas into two major categories: integral protection, and sustainable use. The law specifically prohibits any kind of mineral extraction activity in protected areas under integral protection and in one of the sub-categories of Sustainable Use areas, namely, the Extractive Reserves. However, the National Department for Mineral Production, responsible for all mining activities in Brazil, and the Federal Environment authorities IBAMA and ICMBio have different interpretations of the legal provisions concerning the other sub-categories of sustainable use areas. The DNPM understands that mining is possible in all those areas where it is not explicitly forbidden, whereas the environmental bodies defend a much more restrictive position in regard to granting any permission to carry out mining in any sort of Protected Area.

Thus the DNPM holds that there is no legal impediment to undertaking mining activities in National Forests provided the administrator of the said protected area gives permission. The ICMBio, which is the federal body charged with the responsibility of administering protected areas, states that such permission could only be given provided there was a Management Plan in existence for the respective area and that the management plan foresaw mining as one of the activities allowed in it. The impasse arises because, out of the 304 Federal protected Areas in existence, only 100 have a duly elaborated management plan26. Legal sources connected to IBAMA and groups of lawyers that favour environmental conservation have a more precise view of the issue27. In their view, the proper treatment of the question of mining in the protected areas, apart from their total prohibition in Integral Protection areas and Extractive Reserves, would

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26 Information given by Paulo Henrique Morastegan Carneiro at a Public Hearing before the House of Representatives Standing Committee for the Environment and Sustainable Development held on November 17, 2009.

27 As witness the positions taken by ISA (2006) and Maio Neto (2010).
be as follows: in Environmental Protection areas permission could be granted if mining activities were foreseen in the ecological zoning document and the management plan; in Areas of Relevant Ecological Interest, permission could be granted if the environmental licensing assessment determined that mining activity was compatible with the conservation of nature, the principle objective in creating the Protected Area in the first place; in privately-owned Natural Heritage Reserves mining is prohibited because they now come under the heading of integral protection (there was a presidential veto of a previous provision in the legislation that allowed for mining in Privately Owned Natural Heritage reserves); in Sustainable Development Reserves, mining is forbidden as it cannot be classified as a traditional mode of production that plays an essential role in protecting nature and maintaining biodiversity; in the Fauna Reserves, mining is permitted provided it does not interfere with the use of the Protected Area for scientific studies; in National Forests, mining is prohibited because the objective of creating National Forests is to enable sustainable use to be made of forest resources and mining could very well jeopardise those resources. It must be added that before Law 9.985/2000 was enacted, mining was considered to be compatible with sustainable use and accordingly there are several mining ventures installed in National Forests that were created prior to 2002 when the Law came into force.

New initiatives to change the legal framework governing artisanal mining

The lack of certainty surrounding the interpretation of Law 9.985/2000 and the provisions it sets out on mining activities led Amapá’s federal representative in the house of representatives, Antonio Feijão, to put forward a draft bill (PL 5.722 dated August 2009) designed to make an amendment to the actual law that would provide for artisanal mining activities in National Forests. In its passage before the standing Committee for the Environment and Sustainable Development the draft legislation was altered by an amendment included by the Committee reporter, Representative Marina Magessi, that altered it to read that mining activities would only be allowed in Areas of Environmental Protection and even then, only if it was in alignment with the terms of the Management Plan for the Area, the Land Use Zoning document. and after approval by the Council and the issuing of the
necessary Environmental License. Mining in National Forests would be restricted to those ventures that had received mineral rights titles prior to the creation of the National Forest.

In addition to that draft legislation there is another one before the National Congress which directly concerns artisanal mining. Draft Bill PL 5227/09 proposed by federal representative for the state of Maranhão Cleber Verde proposes alterations to the Artisanal Mining Statute (Law no. 1.685/2008), designed to include artisanal miners as a class in the benefits scheme of the national social security structure in similar way to other classes like rural labourers, and small-scale fishermen, and in that way guarantee to artisanal miners that on completing 60 years of age (55 for women) they will have the right to an old-age pension to the amount of one official minimum salary a month. The onus of proving the individual’s working condition as being indeed an artisanal miner and of proving his or her length of service is placed on the entities that represent their class, like miners associations and cooperatives.

An additional provision proposes that the pension be increased to three official minimum salaries a month in the case of artisanal miners that can prove that they worked in the Serra Pelada mines for at least 60 months. The standing Committee on Social Security and the Family gave the Bill its approval and it is still running its course awaiting the approval of the Standing Committees for: Constitution, Justice and Citizenship; and Tax and Finance.

In regard to the question of Brazilian artisanal miners working inside French Guiana, there are legal devices before the National Congress that deserve attention. The first is a Bilateral Brazil-France Agreement covering the question of combating the illegal extraction of gold in protected zones or areas of heritage interest. The agreement was signed on December 23, 2008 by the Foreign Ministers of the two countries. It provides for:

"the implementation of the necessary measures to combat all illegal extraction and trading in raw gold especially its sale or re-
sale as well as all transportation, detention, sale loan or concession of mercury undertaken without due authorization. It also provides for the seizure and eventual destruction of goods, materials, and instruments used for the illegal extraction of gold." (Message 2009: 2).

The geographic outreach of the agreement’s terms covers all the national parks and protected areas lying within a 150 km wide strip along the frontiers. Although the Army has used that agreement to justify its actions on the Oiapoque River in legal terms, the agreement has not actually been ratified by Brazil. It is still in the hands of the Foreign Affairs and Defence Committee and awaiting a public hearing called for by the parliamentarian responsible for preparing the committee report on it, Sebastião Bala Rocha (PDT-AP). On that occasion, the repercussions for the municipality of Oiapoque will doubtless come up for discussion. The same committee is setting up a working group to accompany the developments of conflicts involving gold mining in the frontier region between Brazil and French Guiana. In addition to the parliamentarians with a seat on the Committee, representatives of the federal government, of the Amapá state government and of the Amapá state legislature are expected to make up the working group.28

Another initiative involving cooperative between Brazil and French Guiana in the frontier area concerns cooperative between the police forces of the two countries (Draft Legislative Decree no. 3032/2010). This protocol is aimed at intensifying cooperative in the trans-frontier region by fostering the exchange of information and promoting regular physical exchanges, especially in terms of technical assistance and investigation of the methods used and tendencies evinced by those committing the infractions in the frontier region between Brazil and French Guiana (Brazil s.d.). The project is further justified by considerations that go beyond the question of gold prospecting activities in terms of the great population influx that

28 There is no news of any effective activity of this working group up to now.
the bi-national bridge over the Oiapoque will be bringing to the region and the possible consequences in terms of spatial and social disorder.\(^29\)

**Change of Government in the States of Amapá and Pará**

In both states (Amapá and Pará) there has been a change in government, and in both cases there is liable to be a change of ideological direction in policies. In Para, the government formerly held by the Workers Party –PT has given place to the return of the former governing party, the PSDB (Governor Jatene), and in Amapá, the new governor in 2011 is Camilo Capiberibe, son of former governor João Capiberibe. Although João Capiberibe’s government always took a firm stance against industrial mining in the state, its performance in regard to artisanal mining was far from successful. The new government of the son has not yet made its position clear in relation to mining, industrial or otherwise. Similarly, in Pará there is, as yet, no clear indication as to the position the Jatene government will adopt in regard to all these issues.

**Administrative decisions indicative of change**

Although there has been no clear definition of new polices in the sphere of state government, two recent federal decisions stand out because they seem to indicate a change of attitude in the environmental field (ICMBio) and the area of mineral extraction (DNPM).

The community known as Vila Brasil\(^30\) is a 100 km from the city of Oiapoque on the river of the same name and faces the indigenous area known as Camopi, across the river, on the French side. It began its existence associated to gold mining done by suction dredges on the Oiapoque River in the 1980s. That means that it existed well before the creation of the National Park. Because of that there have been a series of conflicts as the law demands that no human beings be allowed to reside in

\(^29\) In the word of the report presenter (Nelson Pellegrino PT/BA)

“Associated to the inauguration of this land link there are risks of conflicts involving artisanal miners both on the French and Brazilian side and a tendency to the disorderly installation of new settlements along the highway, exacerbating problems stemming from the lack of any urban infrastructure, land tenure conflicts, acceleration of deforestation and increase in burning, all posing serious risks for local sustainability; as well as increases in trans-frontier crimes, like smuggling and trafficking in drugs and illicit substances etc” (Committee).

\(^30\) For further information see Vila Brasil: Soares & Chelala (2009), Monteiro (2009).
the park while the community is naturally and rightfully anxious to preserve its right of residence. The administration of the Park had to make use of a legal device to get around the problem and declared the settlement a Zone of Conflicting Use, declaring the need to establish a way of regulating the situation of the area by establishing a series of commitments to be made both by residents and by the park administration (Folha de São Paulo January 07, 2011). The ICMBio had more than that in mind however, when it conceded the community’s right to residence and that has been revealed in the strategic attribution to Vila Brasil of the function of support centre for an effort that is being made to stimulate ecotourism in the Park.

The ICMBio’s idea is to keep the population in the settlement at a stable level, and that idea is also guiding the actions of the Army in the region. However not everyone is agreeable to the plan and it is being criticised by politicians that represent the state of Amapá\textsuperscript{31}. The ICMBio makes it clear that the solution found for Vila Brasil is not applicable to the community at Ilha Bela because the Institute does not recognise the pre-existence of the Ilha Bela community prior to the creation of the national park, and in fact it exists basically as a support base for gold mining activities and as such it is legally liable to intervention and repression.

The second notable fact is the licensing of a mining operation within the boundaries of the Oiapoque municipality\textsuperscript{32}. The license is an artisanal mining permission to work mineral deposits, issued by the DNPM on February 15, 2011 in the name of the Oiapoque Artisanal Miners Cooperative and refers to an area of 976.57 hectares (process no. 858043/2009). The environmental license for the same was issued at the end of 2010. However, at the beginning of this year the IBAMA declared that the licence referred to an area that was within the boundaries of the State Production Forest and as such it should be revoked. According to information supplied by the Cooperative, it has around 400 members, all artisanal

\textsuperscript{31} See for example the speech of Representative Dalva Figueiredo at the CAINDR Public Hearing (Brazil 2010).

\textsuperscript{32} Information given orally by the Director of the Natural Resources Division of the Amapá State Trade and Industry Department.
miners and most of them originally come from French Guiana. There is no reliable information available as to how many artisanal miners are actually working in the area, but rough estimates put the number at around 100 individuals. The Government of Amapá now needs to state its position in regard to the impasse.

11. Final remarks
In view of all the dynamic processes described above, what scenarios can we envisage or expect for the future?

(1) The repression directed at Brazilian artisanal miners working inside French Guiana will doubtless continue, but it will never manage to extinguish the activity entirely. In spite of all the increasingly concentrated and well-coordinated efforts being made by the Brazilian and French forces, clandestine artisanal mining in French Guiana will never disappear completely. Bearing in mind rough estimates that put the deposits of gold in French Guiana at somewhere around 400 tons, and that the amount extracted over the last 25 years was somewhere around 300 tons, then it is reasonable to suppose that there is enough gold left to keep the activity going for another decade, and that is without taking into account the fact that new deposits may well be identified as time goes by. One of the effects of the intense repression and the destruction of tools and equipment in the gold working areas is that it is stimulating a form of prospecting marked by the constant search for new virgin areas with high levels of gold content in the deposits. The high risk of losing all their equipment and having their dwellings destroyed can only be compensated for by workings with very high return on the mining efforts. That process has greatly accelerated both the opening up and abandonment of workings.

(2) The repressive actions designed to “clear” the area of artisanal miners does not take the miner out of his profession but merely makes him seek to exercise it in another area where local geological conditions and external factors, like the price of gold, risks, repression and the cost of production, make the artisanal extraction of gold feasible in economic terms. Obviously the cost/benefit calculations made by artisanal miners who only contribute their labour and those made by the owners of the machinery and other
means of production vary considerably. The escape valves are the very remote areas in the interior of French Guiana or even in neighbouring Suriname and Guyana. Brazil's frontier region is not very suitable to serve as an area of escape due to the coverage of the area by Protected Areas or Indigenous Reserves, and also, the much more marked presence of the state and its agents of repression than is the case in the neighbouring countries.

(3) The inauguration of the bi-national bridge over the Oiapoque, expected to take place at the end of 2011, will also bring with it big changes in the social, economic and spatial organisation of the Oiapoque /Saint George region. How the former miners are going to fit in to the new context is hard to tell. Only significant growth of the local economy would ever be able to absorb such a large work force or attract capital on the same scale as is invested in artisanal mining. It is still an open question whether the bridge will in fact boost the local economy and if that boosting will tend to foster the formal economy or informal activities like smuggling.

(4) Any public policy that wishes to be sustainable in its efforts to impede gold mining in protected areas needs to do much more than merely suppress the activity. It is imperative that any interdiction of artisanal miner gold mining in a given territory should be accompanied by measures designed to construct alternatives to the activity by offering other areas with geological characteristic appropriate for that scale of activity. If the object of policy is to take the miner out of prospecting altogether, then possible alternative occupations suited to the background and experience of such miner-workers must be thought of.

(a) If on the other hand artisanal mining comes to be recognised as a legitimate way of using a natural resource – in the same way as the non-use of natural resources is legitimised in areas under an Integral Protection regime, then what need to be found are ways of reducing the social and environmental degradation historically associated to the activity. That would mean changing the approach used in the repressive actions from the wish to curb the activity to the wish to ensure it is exercised in the most
sustainable way possible in social and environmental terms. Obviously the latter type of intervention is infinitely more complex than just going in to destroy machinery or arrest the miners. On the other hand there do exist feasible technical alternatives that are socially acceptable to the artisanal miners and capable of modifying the methods of extracting and recovering gold in such a way that they meet the most rigorous social and environmental requirements.

(b) If the policy is designed to deny the legitimacy of artisanal mining as a way of extracting mineral and intends to extinguish it entirely as an economic activity, then it will be doomed to fail. For an intervention to last and gain in sustainability, it needs to transform the subjects of the activity. In concrete terms, it means offering artisanal miners an alternative occupation and source of income that they and their families consider more advantageous than what they gain from mining. The first step in that direction is to perceive them and accept them for what they really are: social actors endowed with autonomy and self-determination.
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AGU impede retorno de garimpeiros à Floresta Nacional do Amapá por exploração e degradação ambiental. Exploração de minérios por garimpeiros na Floresta Nacional do Amapá não tem autorização do DNPM e do ICMBio.


BRASIL (s.d.). Câmara dos Deputados - Comissão de Segurança Pública e Combate ao Crime Organizado. Comissão de Segurança delibera sobre projeto sobre cooperação entre Brasil e França. Disponível
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