

## **APPENDIX VI: NATIONAL CASE STUDIES**

### **I. Countries visited for the study**

- 1. Burkina Faso**
- 2. Mali**
- 3. Senegal**
- 4. Ghana**

### **II. Countries not visited but for which certain data are available**

- 1. Liberia**
- 2. Guinea**
- 3. Guinea-Bissau**
- 4. Mauritania**
- 5. Togo**
- 6. Chad**
- 7. Côte d'Ivoire**
- 8. Sierra Leone**

## Protected Areas

In Burkina Faso, the main regulatory text governing PAs is the law on forestry. It distinguishes two specific categories of PA:

1. Public forests (Livre I, art.16), which are all classified or protected.
  - According to Article 16, depending on how important a forest is to the general interest, the forestry classification can subject it to a special restricted regime regarding the rights of usage and exploitation. Forests that have not been classified are called protected forests. They are subject to the general rights of usage and exploitation.
  - The classification text specifies the objectives of classification, the surface area, the exact boundaries of the forest, its main or exclusive purposes and how it should be managed (Article 29)
  - Forests are protected against all forms of degradation and destruction, whether natural or provoked (Article 43).
2. Wildlife protection areas (Livre II, Article 77 onwards), which include:
  - National parks,
  - Strict or partial wildlife reserves
  - Biosphere reserves
  - Sanctuaries
  - Ranches
  - Local refuges
  - Village hunting zones

Apart from exceptional cases, and depending on the provisions of the original documentation or development plan, national parks are exempt from land-use rights. The park's original documentation must, if necessary, specify compensatory measures planned to benefit the local community.

Within national parks grazing, land clearance, hunting, farming, forestry activities, mining, dumping, polluting, uncontrolled fires and in general any acts incompatible with the conservation and protection of the environment are prohibited.

Strict wildlife reserves are set up to protect all wildlife species and hunting is prohibited there. Partial wildlife reserves are set up to protect certain species and hunting is permitted.

In other words, apart from bans or restrictions on hunting, wildlife protection areas other than national parks are not exempt from land-use rights.

Out of the 76 PAs identified (some very small ones were not taken into consideration), there are 2 national parks (Kabore-Tambi and W), 21 partial or strict wildlife reserves and 53 classified forests.

Within the Ministry of the Environment and Sustainable Development, the Wildlife and Hunting Directorate and the OFINAP (national office for PAs, a public body) are responsible for monitoring PAs (cf. RAPPAM Burkina Faso).

NB: classification and protection by-laws, often old, were not able to be consulted apart from those from 1913 to 1983 that concern wildlife and are available at the Wildlife and Hunting Directorate.

## Mining Law

The mining law, like all mining laws in the sub-region, stipulates that all mineral resources are Government property and that no one may undertake exploration or mining of these resources without prior authorisation.

The articles in the mining law that concern PAs in particular or environmental protection in general are the following:

- a. *Exclude from mining licences areas set aside for environmental preservation and the protection of archaeological sites (Article 64). Activities governed by mining law must be carried out such that the environment is preserved and managed and that mine sites are rehabilitated according to the standards, terms and conditions stipulated in current legislation (Article 76).*
- b. *Anyone submitting a mining licence request, except for exploration permits or quarry permits, who wishes to carry out activities liable to affect the environment must, in compliance with the law on the environment and depending on the case, provide an impact notice or carry out an Environmental Impact Assessment as well as a public survey, and provide a plan to mitigate or strengthen the negative or positive impacts. Any change in the planned actions must receive prior authorisation by the mining authorities (Article 77).*
- c. *All holders of a mining licence other than an exploration permit or any beneficiary of a mining licence apart from a quarry permit is required to open and contribute to a trust fund account at the Central Bank of West African States or in a commercial bank in Burkina Faso, in order to accumulate funds to cover the costs of the environmental preservation and rehabilitation programme. The amounts used in this way are tax deductible against industrial and commercial profits. The terms and conditions for managing and contributing to these funds are established by mining regulations.*
- d. *In addition to the provisions of mining law, holders of mining licences and beneficiaries of permits are also subject to the general laws and regulations in force, particularly those concerning environmental preservation and management, buildings classified as dangerous, unsanitary or uncomfortable and the protection of forest and cultural heritage*

In the process of granting mining licences, the protection of classified areas is applied: all licence requests must be checked by the mining cadaster (Directorate of Geology and Cadaster), which verifies that the licence requested (whether it be an exploration or a mining permit) does not encroach on either classified forests, national parks or strict reserves.

However, note that the mining cadaster uses topographical maps at a scale of 1/200 000 to define the boundaries of PAs, without taking into account any changes to these boundaries made by the OFINAP.

Furthermore, no map of archaeological sites or cultural heritage is available at national level, even though these sites are in theory excluded from mining activities.

## Environmental Legislation

The law on the environment and the associated decree on impact assessments specify the terms and conditions for carrying out environmental impact assessments (EIAs).

Note that the Ministry of the Environment published a “*Guide général de réalisation des études et notices d’impact sur l’environnement*” (General guidelines for carrying out environmental impact assessments and impact notices) (2007), as well as various sector guides including the “*Guide sectoriel d’étude et de la notice d’impact sur l’environnement des projets miniers*” (Sector Guidelines for mining project environmental impact assessments and impact notices) (2007)

The process for carrying out environmental impact assessments is shown in Figure 1.

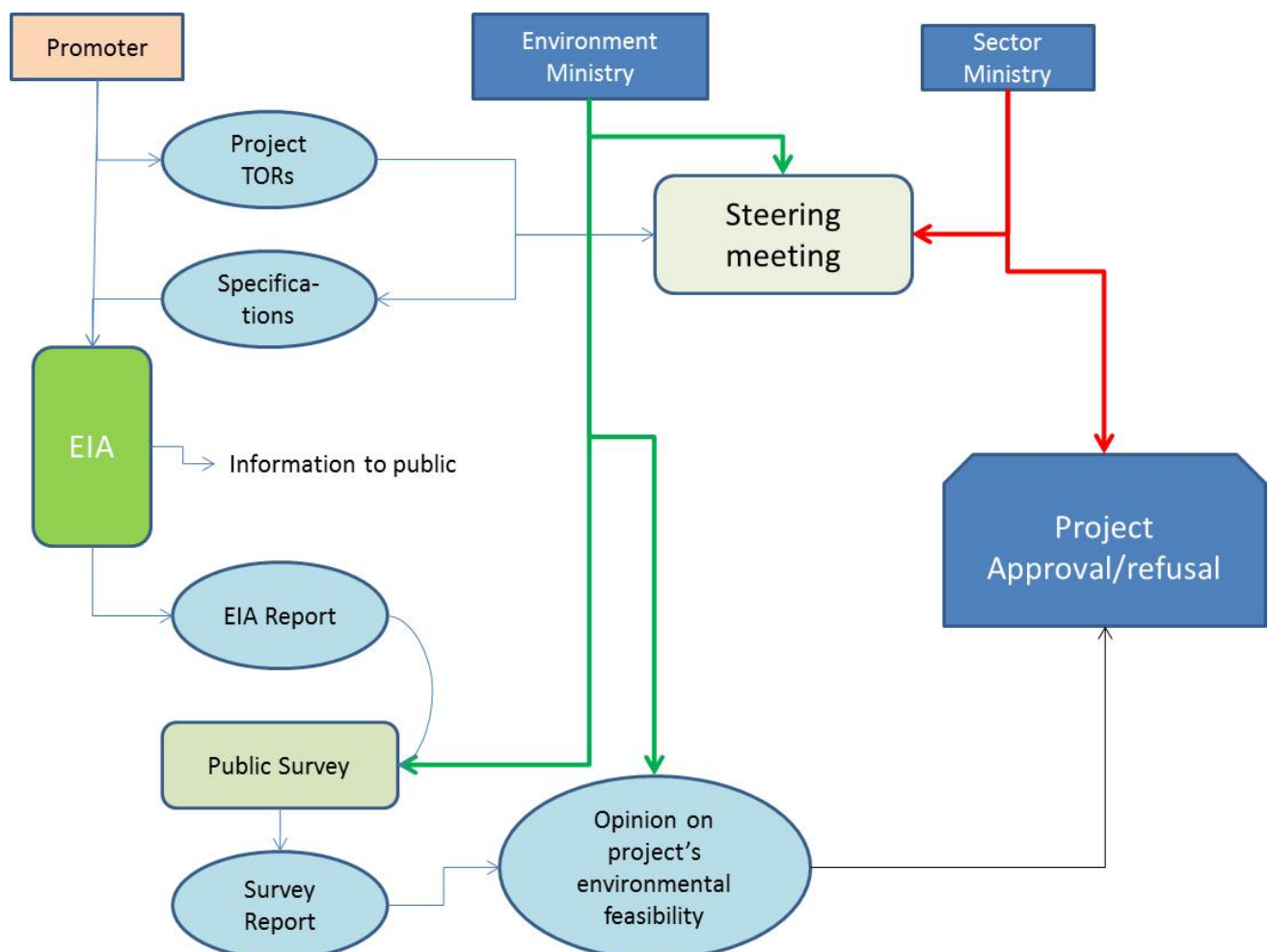


Figure 1: General procedure for Environmental Impact Assessments.

The terms of reference for the EIA are submitted to the Ministry of the Environment before it is carried out. The specifications are drawn up by the Ministry of the Environment, with the support of the ministry responsible for mining.

Once the EIA is received, the Ministry of the Environment organises a public survey and awaits the results of the survey before issuing an opinion on the project's environmental feasibility. Only after this does the Ministry responsible for mining accept or refuse the project.

As regards the public survey itself, it is publicly posted at the *Préfecture* and in the Town Hall and is published in the press.

## Geological and Mining Situation

### Geological Context

Burkina Faso is predominantly basement complex. Sedimentary basins only cover a small part of the country at the north-western border and at the border with Niger and Benin. Mining potential is as follows:

- Gold along all the “green rock” belts (volcanic sediment of the Birimian): many occurrences are known, 6 gold mines are in operation (Inata, Essakane, Youga, Taparko, Mana and Kalsaka) and a seventh should soon open (Bissa).
- Zn: the Perkoa deposit has been known about for a long time and, after several unsuccessful attempts, should soon be opened.
- Mn: the two main areas with manganese are Kiéré (Houndé region) and Tambao (north of Dori). These mines have been on the point of opening... for a very long time. (Mining of these deposits poses problems because they are far from a maritime port. Manganese is a heavy metal, usually exported by ship. Several projects are under consideration: transport of the ore by road, a railway to link Ouagadougou to Tambao and then reinforcement of the existing line between Ouagadougou and the Ivorian or even Senegalese coast.)
- Diamonds: the south-western border of the country (south-west of Banfora) is known for alluvial diamond occurrences (but no mining is envisaged for the moment).
- Bauxite: some occurrences of bauxite are known in the region of Kaya, but do not have much economic value in comparison with the deposits in Guinea or Mali.
- In the sedimentary basins the following is found:
  - o Limestone for cement production in the Sahel (north of Dori): these occurrences are too far from the main towns to present any real economic interest (if a railway line were opened for manganese this could change).
  - o Phosphates at the border with Benin and Niger: some of these occurrences (in particular Kodjari) present real economic potential but are located in the W National Park or in the neighbouring classified forests.

### Distribution of Mining Licences (data updated January 2011)

- a. Exploration licence: more than 420 exploration permits are currently valid, totalling 57 430 km<sup>2</sup>, of which 56 000 is for gold. In relation to the 274 000 km<sup>2</sup> of the country, this means 29% of the national territory is covered by mining exploration licences.
- b. There are seven mining licences, covering a total of 959 km<sup>2</sup> of which 667 km<sup>2</sup> are for the Taparko mine alone. All the other mining licences are for areas of less than 100 km<sup>2</sup> (less than 50 km<sup>2</sup> for Mana and Essakane, even though these are international scale companies).

- c. There are also “traditional artisanal or semi-mechanised mining permits” and “quarry permits”. Artisanal gold miners must work in clearly specified areas and several “expulsions” of those working outside these authorised zones have occurred.

In economic terms, Burkina Faso produced 12.15 tonnes of gold industrially in 2009. The contribution to the GNP of the mining sector in 2009 was barely 3%, despite the fact that the sector represents more than 40% of export revenues.

## **Mining Pressure on the Environment:**

According to the RAPPAM data analysis, the only mining pressure noted in the surveys on PA management is the presence of artisanal gold mining in the Sahel reserve. This activity has been carried out here for decades (and is not actually prohibited because this area is a pastoral reserve) and the human pressure can be very high. There are regularly several hundred people looking for gold in the area. However, this is not the only area for artisanal gold mining in Burkina: the classified forest of 2 Balés and the surrounding classified forests are regularly visited by gold miners.

Mining licences and quarry permits are attributed outside PAs, with a few rare exceptions:

- a. The classified forest of Nazinga is covered by a gold exploration permit (Tiakané, Randgold) granted in 2005. Officially, Nazinga is a game ranch, which does not officially prohibit mining prospection.
- b. Nakambé classified forest is covered by a gold exploration permit (Tanéma, Randgold) also granted in 2005.
- c. The Deux Balés National Park (currently under creation), partly overlaps with the Poura I (SOREMIB) gold exploration permit. However, there is some doubt as to the validity of this exploration permit, granted in 1991.
- d. The status of pastoral area and partial wildlife PA of the Sahel reserve (Decree 70-302/PRES/AGRI dated 09/12/1970) forbids all industrial cropping, bushfires and timber felling, but no other human activities. The exploration and mining licences (Essakane and Inata) are therefore legally compliant.
- e. Artisanal gold mining: in Burkina Faso, artisanal gold mining can be carried out with a “traditional gold-mining licence”, which covers an area of 1 to 100 ha, and is valid for 2 years. After several illegal expulsions of artisanal gold miners, as soon as a site begins to produce enough gold, it is usually the buyers who request the licence, which is only granted if it is outside a PA (and does not overlap with another mining licence). This policy has helped to reduce clandestine gold-mining activities, but not to eliminate them completely (furthermore, the search for new artisanal gold mining areas is usually uncontrolled and can happen in PAs).

Protected Area Name	Confirmed Risk	Location	Probable Risk	Potential impact
Arli			Phosphate	average
Singou			Gold	low
Pama	Artisanal gold mining	Outside PA		
Deux-Balé	Artisanal gold mining	Outside PA	Gold	average
W du Niger			Phosphate	average
Nazinga			Gold	high
Pâ	Artisanal gold mining	Within PA		
Sahel	Industrial mining	Within PA	Gold	
Mare d'Oursi			Iron ore	low
Sorobouly	Artisanal gold mining	Within PA		
Ouilingue	Industrial mining	Outside PA	Gold	
Bontioli	Artisanal gold mining	Outside PA		
Nabere	Artisanal gold mining	Outside PA		
Nakambe			Gold	low
Laba			Gold	average
Boulon	Artisanal gold mining	Outside PA		
Tui			Gold	average
Baporo			Gold	average
Tiogo	Artisanal gold mining	Outside PA		

Summary of the risks posed to PAs in Burkina.

## Civil Society

Representatives of civil society were met through ORCADE (Organisation for capacity building and development). ORCADE is involved in the EITI process in Burkina Faso. They help with the public surveys for the EIAs and around mining sites they work with village associations set up to monitor the effects and impacts of mining operations. From April 2011, ORCADE is going to set up training courses on mining sites for mining companies, local elected representatives, government representatives (prefects and decentralised government technical departments for Health, the Environment, Agriculture, livestock farming etc.) and local communities. This training will focus on environmental monitoring and natural resource management, the economic impacts and opportunities of mining exploration and the rights and obligations of the local populations.

The key points highlighted by ORCADE are:

- Local communities must be involved from the outset in the feasibility and impact studies.
- The mining companies must communicate and inform local elected officials and Government representatives of their various actions. In particular, they should not replace the Government in terms of policy on health infrastructure, hygiene and training. They can,

of course, support national or local programmes, but should not undertake actions that have not been agreed upon with the local authorities.

- The environmental departments must mobilise the necessary resources to ensure effective environmental monitoring of mining projects.

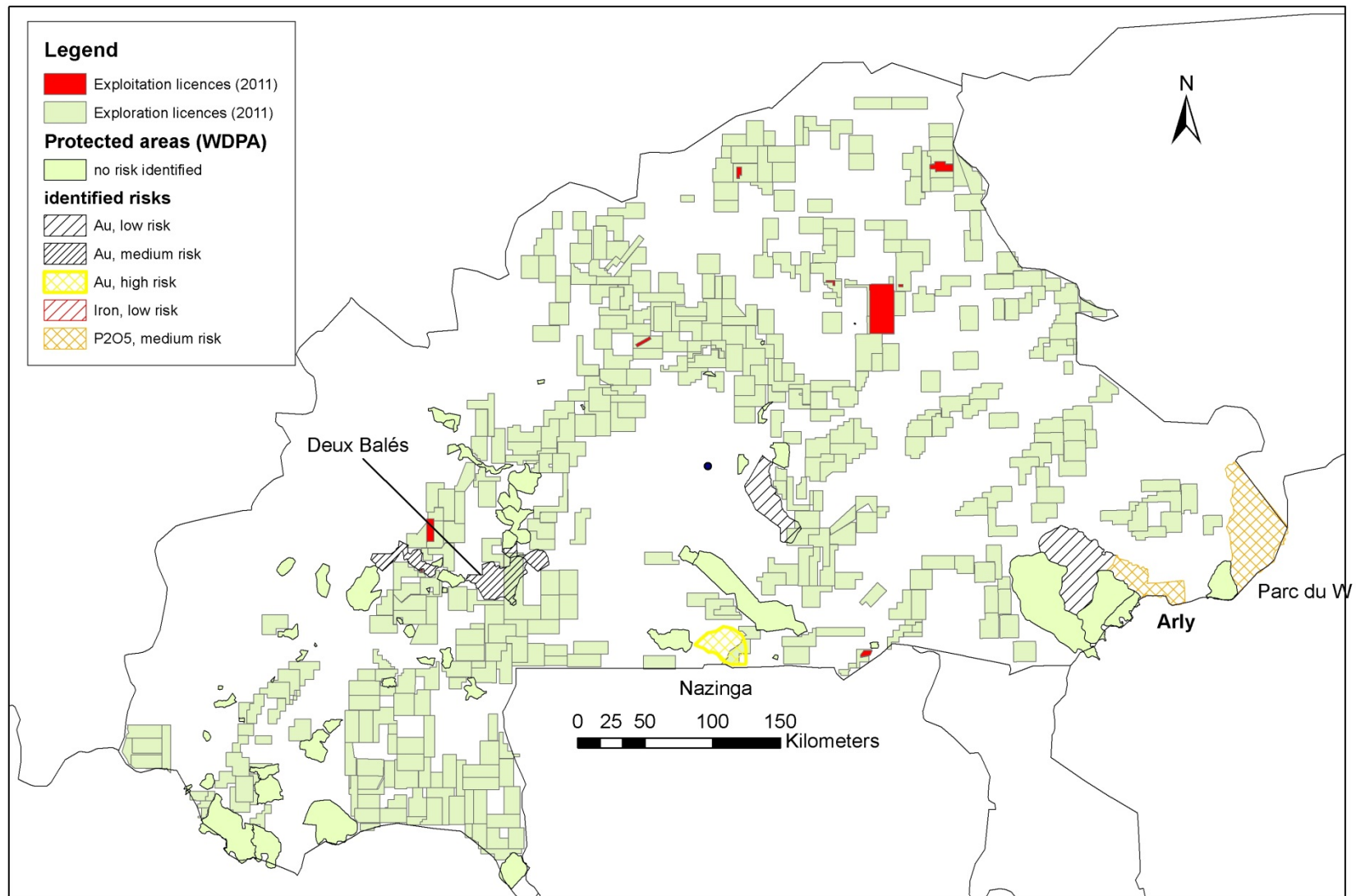
## Specific Problems

- a. Modification of the statutes and boundaries of the Sahel partial wildlife reserve: the OFINAP is currently reviewing the Sahel reserve, which, in its current state only fulfils a few biodiversity conservation functions. The area could be replaced with five areas that encompass in particular the main waterholes (important stopover for migratory birds, two of which are IBAs), and protection could be increased. The potential difficulty lies in the prior existence of a mining licence, including a manganese exploration permit (Tambao mine) which is currently undergoing a feasibility study.
- b. Risk of phosphate in W Park: the entire W PA and more specifically the Nigerien and Burkinabe sections contain phosphate occurrences which could be economically interesting (the production of phosphate fertilizer is also strongly encouraged to support agricultural production).
- c. Lack of resources at ministry level: both OFINAP and the Directorate for environmental audits and inspections, lack the financial resources to effectively control mining activities in the field. In addition, there is no laboratory specifically for mining analyses (the environmental laboratory, which is part of the Ministry of the Environment, is only equipped to carry out waste water analyses). A bill is being studied to ensure a percentage of financial sanctions is attributed to inspections (but in fact, no financial sanctions have yet been decided upon). The OFINAP must generate its own revenues through tourism, hunting and fishing in the areas it monitors (the greater the human pressure, the greater the revenues...).

## Some Proposals

- “Back to basics”: above all, environmental departments should gather all the data on PAs and organise the information in the form of documents that are easily accessible by the public (digital maps of PA boundaries, the by-laws creating the PA, list of authorised and forbidden activities).
- Draw up an inventory of the biodiversity for each national eco-region that can be used by everyone (one of the difficulties encountered in the EIAs is the lack of “baseline data” on animal and plant biodiversity. Existing EIAs contain some of this information that should be made better use of, rather than just letting it lie dormant in documents that are difficult to access).
- The environmental rehabilitation fund: difficult to disburse funds because it depends on a tri-partite agreement among the Ministries of Mines, the Environment and Treasury.
- Establish and/or reinforce participatory frameworks involving mining companies, the Government (in particular via local elected officials) and the population.





## References

- Forest Law: 006197/ADP dated 31/01/1997
- Mining Law: 31-2003/AN dated 08/05/2003
- Law on the Environment: 005/97/ADP dated 30/01/1997
- Decree governing EIA application: 2001-342/PRES/Pm/MEE

### Other documents:

- *Parcs et réserves du Burkina Faso* – 2009, UICN
- *Les orpailleurs du Burkina Faso: exclusion sociale et rapport à l'environnement* – 2004, Doctoral Thesis, D.B. Somé
- *L'exploitation artisanale de l'or au Burkina Faso, sa place dans l'économie, son organisation, ses impacts socio-économiques et environnementaux* - S. Savadogo, Ecole des mines d'Ales.
- *Etude diagnostique du cadre institutionnel et juridique de l'activité minière industrielle au Burkina Faso: cas de Poura et Essakane* – 2006, ORCADE-OXFAM

## MALI

### Summary

Mali is one of the largest mining countries in West Africa and the main mining areas are located on the borders with Senegal and Guinea, which are also the areas in Mali where a minimum of biodiversity still survives.

Protected area management in Mali is in the early stages. Only Baoulé National Park has a Park Manager, the others are just under the surveillance of Water and Forestry agents. Newly created PAs are often privately managed but this is too recent to be able to assess their management effectiveness.

There is currently some tension between the Ministry of the Environment and that of Mines, despite the basic regulations which should enable them to work side by side to everyone's satisfaction. The plans to enlarge certain PAs in the mining zone (UNDP), will perhaps help to provide solutions to this situation.

### Protected Areas

#### Legal Aspects

In Mali, classified forests are defined by the law on forestry, while other PAs are defined by the law on wildlife management.

Classified forests are defined in the forestry law of 1986 and then in law No. 95-004 on management of forestry resources and finally in law No. 10 of July 2010, abrogating the previous one:

- **Article 5:** State classified forests include natural forests, protection perimeters, restoration areas, re-planting areas, green belts, forestry plantations and woodlands that are protected for sociocultural, religious or aesthetic purposes in the national interests and which have been officially classified by the Government.
- **Article 41:** Forest land rights do not apply in State classified forests, including mining, exploring, prospecting, surveying and all other form of occupation. NB: in the former law, the text stipulated that "before exploring or operating quarries or mines, opening a transport line or modifying its layout, or building structures in (national) forests, all persons or organisations must have prior authorisation from the competent authorities and must take all measures to protect the environment as required by law".
- **Article 110:** any person or organisation that, without permission, digs the ground, extracts or removes sand, peat, grass, stone, earth or generally speaking organises exploration and/or mining in a classified forest, whether they occupy the land or not, will be fined 500 CFA Francs per m<sup>2</sup> of area damaged and/or occupied, in addition to confiscation, restoration of the site and damages etc.

The different reserves are defined in the wildlife management law (law 95-031) as follows:

**Article 2:** National wildlife reserves include areas set aside for the conservation of wildlife: strict nature reserves, national parks, wildlife reserves, special reserves or sanctuaries, biosphere reserves, hunting areas and all areas dedicated to protecting and promoting wildlife.

**Article 14:** Strict nature reserves are areas set aside to enable natural ecological factors to interact freely without outside intervention, except for measures to safeguard the existence of the reserve itself.

**Article 15:** National parks are areas set aside for the protection, conservation and propagation of wildlife and plant life and to protect sites, landscapes or geological formations that have particular scientific or aesthetic value.

**Article 16:** Wildlife reserves are areas set aside for the conservation, development and propagation of wildlife and to protect and develop its habitat.

**Article 17:** Special reserves or sanctuaries are areas set aside to protect characteristic communities of wild animals or birds or to protect animal or plant species that are particularly endangered as well as the habitats they need to survive.

**Article 18:** A biosphere reserve is a national reserve declared as world heritage due to its biological, ecological, cultural or historic particularities.

**Article 19:** A hunting area is a prepared area where hunting, capture, fishing or tourism activities are organised.

**Article 20:** A leased area is an area where the right to use the land is leased to a person or organisation, referred to as a hunting guide in a hunting area, a wildlife reserve or special reserve.

**Article 21:** A buffer zone is an area designated to protect natural reserves, for scientific research and the rational use of natural resources.

**Article 22:** A game ranch is an area that is specifically designed to raise wild animals for commercial purposes.

**Article 39:** The following activities are strictly forbidden in strict nature reserves: hunting and fishing, all forestry, agricultural and mining activities, grazing, exploration and prospecting, surveys, landscaping or construction, all work that will modify the landscape or vegetation, all water polluting activities and in general any activities that will damage or disturb wildlife or plant life and any introduction of exotic animals or plants.

**Article 40:** In strict nature reserves, it is also forbidden to reside, enter, circulate, camp or fly over at an altitude of less than 200 metres without special authorisation from the wildlife director.

**Article 41:** In national parks, hunting, killing and capture of wildlife and the destruction or gathering of plant life are forbidden, unless it is for scientific purposes or to develop the area. In these cases special measures will be taken by the park authorities or under their supervision.

**Article 42:** The activities forbidden in Articles 39 and 40 are also prohibited in national parks, unless required by the park management authorities.

**Article 43:** The hunting, killing or captures of wildlife are forbidden in wildlife reserves unless it is for development purposes to achieve the results stipulated in Article 16, and when these measures are taken by the reserve authorities.

Mining activities are expressly forbidden in classified forests and reserves. The law was even tightened up in 2010, as negotiation was previously possible.

However, while the law on wildlife management is clear, the law on forestry remains ambiguous on two counts:

- Mining is classified along with the different activities that are covered by forest land laws, and yet mining rights override land rights.
- The creation of specific sanctions for a sector of activity that is not governed by the law itself seems legally questionable.

The Agency for the Environment and Sustainable Development (French acronym AEDD) was created in July 2010. Its mission is to coordinate the implementation of the National Environmental Protection Policy and to ensure that environmental aspects are taken into account in all policy. This public body answers to the Ministry of the Environment and is governed by a board, on which the

ministries of Agriculture, Finance, Industry, Livestock Farming, Craft and Education are represented. Strangely, the Ministry of Mines is not mentioned.

Since 2008, the Ministry of the Environment has been attempting to pass a tax covering the cost of processing EIAs: Decree 346 of 26/06/2008 established a tax of 1.5% of the total cost of the project. At the request of the Ministry of Mines, this decree was reviewed in 2009 by Decree 09-318 of 26/06/2009 which stipulates that the tax is set by common agreement among the ministries concerned. Finally, inter-ministerial by-law No. 10-1509, signed by the Ministers for the Economy, the Environment and Industry (but not the Minister of Mines and with no mention of the mining law) defines eight categories of investment with varying tax rates from 1.5% (investment < 100 million CFA francs) to 0.003125% (investment > 100 billion CFA Francs). This by-law also creates a special account in the name of the National Sanitation Directorate, into which the tax must be paid.

The mining law of 2003 allows that, in Article 102, “during the validity of a mining licence, the tax base and the rate of taxation and tariffs will remain as they were when the said licence was granted and no new tax or tariff of any kind will be applicable to the holder or beneficiary during this period, except for mining royalties, taxes and fees”.

The Ministries of the Environment and Mines are having difficulty finding common ground.

## Protected Areas in Mali

A map of the classified forests, albeit a sketchy one, can be obtained from the SIFOR website (forest information system), which is managed by the National Water and Forestry Directorate. Only the location of the forests was obtained, as the names, surface areas and classification dates were not yet up-dated, although the directorate is currently summarising this information.

There are three national parks in Mali, all located in the western part of the country: Baoulé Park, Kouroufing Park and Wongo Park. Baoulé Park is surrounded by three wildlife reserves (Badinko, Fina and Kongossambougou). The other two are very close and surround the Bafing chimpanzee sanctuary.

There are two partial wildlife reserves, one in the centre of the country (Gourma reserve) and one in the south-east, at the Nigerien Border (Ansongo Ménaka). Note that the notion of “partial wildlife reserve” is not specified in Law 95-031.

Two partial wildlife reserves, Mandé Wula and Wula Nema were created by decree in 2010 and are privately managed. It would appear that biodiversity is limited here and that eventually private management will not prove to be particularly profitable.

Note that there is a hunting area (near Wongo Park) in the south west, near the border with Guinea. Other hunting areas are mentioned in the documentation but their exact status is unclear.

NB: the Bandiagara cliffs have “World Heritage” classification.

Several classification projects are underway. In the Bafing area, there is a project to create a PA encompassing the two existing parks and the adjacent hunting zone. There is also a larger project, signed in May 2011, to create a PA that encompasses the Bafing and the two partial reserves created in 2011 (see map). The boundaries of this future area include areas where exploration and mining permits have been granted.

Another area is planned in the east of the country, not far from the Nigerien border (Tamesna project).

The water and forestry directorate is making a precise inventory of these areas and the associated documentation. From the documents that are already available, the following points can be noted:

- Faragama hunting area, created in May 2011: the decree specifies (Article 3) that forestry, farming and mining as well as grazing of domestic animals are forbidden throughout the Faragama hunting area. However, mining exploration activities may be authorised under the protocols signed between the mining authorities and the hunting area authorities in compliance with current law.
- Kouroufing and Wongo Parks: the national park is exempt from all forest land rights.
- Chimpanzee sanctuary: no activities are specifically forbidden and agricultural activities are authorised.
- Nema Wula and Mandé Wula: the wildlife reserve is exempt from all forest land rights (although it is not a classified forest but a wildlife reserve). Forestry, farming, mining and grazing of domestic animals are forbidden throughout the wildlife reserve (although these reserves were created after the mining permits were granted).

Thus there is some confusion between the forestry law and that on wildlife. Furthermore, the texts only mention land rights and not the rights to what is contained in the subsoil (mining rights override land rights), which is likely to pose a problem.

The Ministry of the Environment and Sanitation is posting all environmental regulations as well as data on forest and wildlife reserves and data on the flora and fauna on its website (<http://bd.stp.gov.ml/flore/index1.php>). Unfortunately the site is not completely operational, but is a step towards better communication on environmental problems and should be commended as such.

## Environmental Impact Assessments

Decree 03-594 and its appendix clearly specify the obligations in terms of EIAs. In particular:

- **Article 4:** Projects, whether public or private, involving works, development, construction or other activities in the industrial, energy, agricultural, mining, artisanal, commercial or transport sectors, the implementation of which is likely to affect the environment must firstly undergo an EIA.
- **Article 12 onwards:** “The EIA must include [...] a description and an analysis of the initial state of the site and its natural, socio-economic and human environment, [...] the results of the public consultation process, the environmental monitoring and surveillance programme. [...] The terms of reference are submitted by the project promoter to the competent authorities for approval. [...] The environmental analysis is carried out by an environmental analysis technical committee made up of representatives of all technical departments concerned. [...] The minister for the environment may, after consultation with the sector ministry, suspend the environmental permit when the promoter does not comply with the obligations set forth in the EIA.”
- **Appendix:** the list of projects covered by the environmental impact assessment includes specifically large mines, the construction of refineries, industrial quarries, artisanal quarries and the clearing of more than 10 hectares.

## Mining Law

The mining law does not specify whether there are areas in which mining licences cannot be granted (PAs etc.). However, since 2008, following conflict between the Ministry of Mines and the National Water and Forestry Directorate, no mining licences have been granted in classified forests, at least not in those mentioned on the topographical maps used by the Mining Cadaster, which does not have more up-to-date documents.

The Inter-ministerial Mining Commission (inter-ministerial by-law 3-0934 of 07/05/2003) examines all mining permit requests. The Ministries for Mines, the Environment, Land, Trade, Labour, Customs and Taxation are represented in the commission.

NB: since its members are not technical experts, the commission's effectiveness is limited.

Decree 99-255 imposes EIAs for industrial quarries and small and large mines.

For industrial quarries, the EIA must include:

- A baseline study in accordance with environmental directives,
- A technical description of the quarry site, the work and activities planned and the major ecological impacts of the project,
- An emergency plan if high-security risk activities are planned,
- A provisional programme and budget for rehabilitation and restoration,
- A non-technical summary of the environmental impact assessment,
- An analysis of replacement solutions,
- A brief description of the method or methods used to consult with the local authorities and organisations concerned and the results of this process,
- A cost/benefit analysis
- A plan for monitoring impacts.

For small mines, the impact notice must include:

- A baseline study in accordance with environmental directives,
- An assessment of archaeological heritage before work is undertaken,
- The measures envisaged to mitigate the negative impact of mining on the environment,
- A provisional programme and budget for rehabilitating and restoring the mining sites.

All mining permit requests must include:

- A baseline study in accordance with environmental directives,
- An assessment of archaeological heritage before work is undertaken,
- A technical description of the quarry site, the work and activities planned and the major ecological impacts of the project,
- An environmental monitoring programme,
- An emergency plan if high-security risk activities are planned,
- A provisional programme and budget for rehabilitation and restoration,
- The measures to prevent or mitigate the major impacts of the project,
- A non-technical summary of the environmental impact assessment,
- An analysis of replacement solutions,
- A brief description of the method or methods used to consult with the local authorities and organisations concerned and the results of this process,
- A cost/benefit analysis
- A plan for monitoring impacts.

For mines, as for quarries, the amount required for rehabilitation must be deposited in a bank account (Article 17).

Examination of several EIAs reveals the following points:

- Some EIAs (Morila - 1999, Segala – 1997, Tabakoto – 1999, Tamico – 2010, Goukoto – 2010) contain a wealth of information and are well documented, constituting comprehensive environmental reports of the mining area (density and volume of woody plants, estimation of volume by species that will have to be cut down, detailed wildlife inventories, soil mapping, identification of crops and sacred areas etc.).
- EIAs carried out for quarries are much more cursory.

For 2 years now, the National Directorate for Geology and Mines (French acronym DNGM) has had an environmental database financed by a European Union project, designed not only to monitor the EIAs from an administrative point of view, but also to be able to store and use the technical data contained in these EIAs (see Appendix). Unfortunately, this tool has not been used since the project came to an end.

## Mining Economy

Mali is the second largest gold producer in West Africa after Ghana. Annual production is around 50 tonnes (52t in 2007, 43t in 2008, 49t in 2009 and 42t in 2010). The government's income from mining has been close to 200 billion CFA Francs since 2009, in other words more than 10% of the state budget.

As well as the gold mining sector, with new mines planned to open in 2011-2012, Mali aims by 2012 to 2015, to produce 1 million tonnes of cement per year (WACEN project), to boost production of phosphate fertilisers (Malian company TOGUNA), to produce iron (Tienfala) and to become the largest African producer of alumina, overtaking Guinea, with an annual production of 3 million tonnes.

Advanced prospection has been carried out for uranium (in the Falémé sector), but following population movements, this project would appear to be on stand-by.

## Mining pressure on the Environment

In the 2009 report on the state of the environment in Mali, the main scourge affecting forests and PAs was land clearance for cropping. Estimations rise to more than 300 000 ha per year (Maïga 1999).

*Mining and more specifically gold mining is mentioned as an activity which affects the soil (slag deposits, mud holes covering large areas, consumption of large quantities of water) and which presents a threat to ecosystems because of the presence of cyanide. In the conclusions of the report it is stated that "particular attention must be paid to the following mitigation measures:*

- *Intensification and optimisation of agriculture and livestock farming*
- *Rational use of forest resources in the context of implementation of forest development and management plans*
- *Rehabilitation of mines after closure*
- *Restoration of quarries after operation*
- *Reforestation of slag deposits, processed ore piles and mud ponds from gold mining".*

The RAPPAM evaluation for Mali mentions artisanal gold mining specifically as a threat to PAs.



The highest density of mining permits is in the west of the country, along the border with both Guinea and Senegal. Artisanal gold mining is also heavily practiced in these areas, which poses a social and economic problem, particularly in Bafing, but also towards Sikasso: sustainable development projects run by NGOs suffer from a shortage of manpower for agricultural activities, land used for artisanal gold mining is useless for any other purpose and there is considerable chopping down of trees and poaching.

- The Badinko wildlife reserve is covered to a large extent by an iron and bauxite exploration permit, which could eventually become mines.
- In the Malian part of the transboundary Bafing-Falémé project, there are several diamond and gold exploration permits and one for uranium which look promising.
- The special elephant reserve of Douentza encompasses an industrial limestone quarry and a permit for manganese which could lead to a mine (linked to the opening of another mine on the Burkina Faso side).
- This area with manganese also threatens the partial wildlife reserve of Ansongo Ménaka. However, it should be noted that the notion of “partial wildlife reserve” is not recognised in the law on wildlife management.

Regarding the Tamesna area project, there is an occurrence of lignite and one of manganese within the currently proposed boundaries. 30km to the West there are gold permits and 80km to the west are uranium permits.

Whether it be Ansongo or Tamesna, these two areas are totally integrated into the oil blocks (Block 11 is attributed to Mali Oil for Ansongo and Block 14 is attributed to Terraliance Petroleum for Tamesna). The same goes for Baoulé National Park (Bloc 25, attributed to Petroma).

There is indirect pressure from artisanal gold mining on Kouroufing and Wongo parks: loss of manpower in villages neighbouring the parks, which harms the AMCFE sustainable development projects.

Protected Area	Type	Probably mining threat	Possible risk
Baoulé	National Park	None	Oil
Kouroufing	National Park	None	
Wongo	National Park	None	
Badinko	Wildlife Reserve	Iron-ore and bauxite (moderate)	Oil
Fina	Wildlife Reserve	None	Oil
Kongossambougou	Wildlife Reserve	None	Oil
Gourma	Wildlife Reserve	None	Oil
Ansongo Ménaka	Wildlife Reserve	Manganese (moderate)	Oil
	Sanctuary	None	
	Scientific area	Bauxite (low)	

Some experiences of collaboration between mining companies and the water and forestry directorate have given good results, particularly around the Sadiola mine, where some joint development has taken place and the objectives initially set by the environmental impact assessment have been exceeded (better reforestation, development of waterholes and reintroduction of fish, measures to keep game away from sensitive areas etc.)

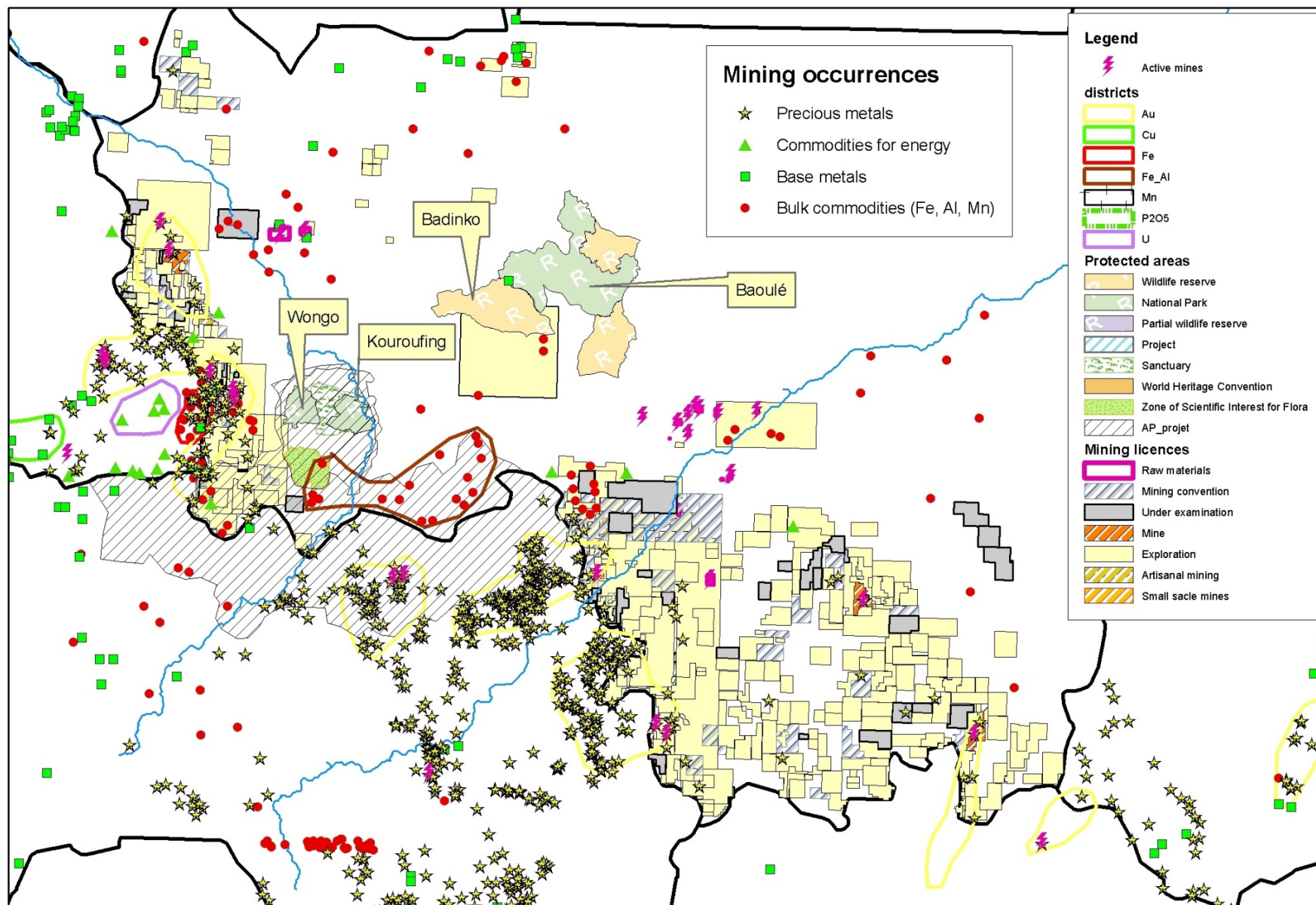
## Conclusion

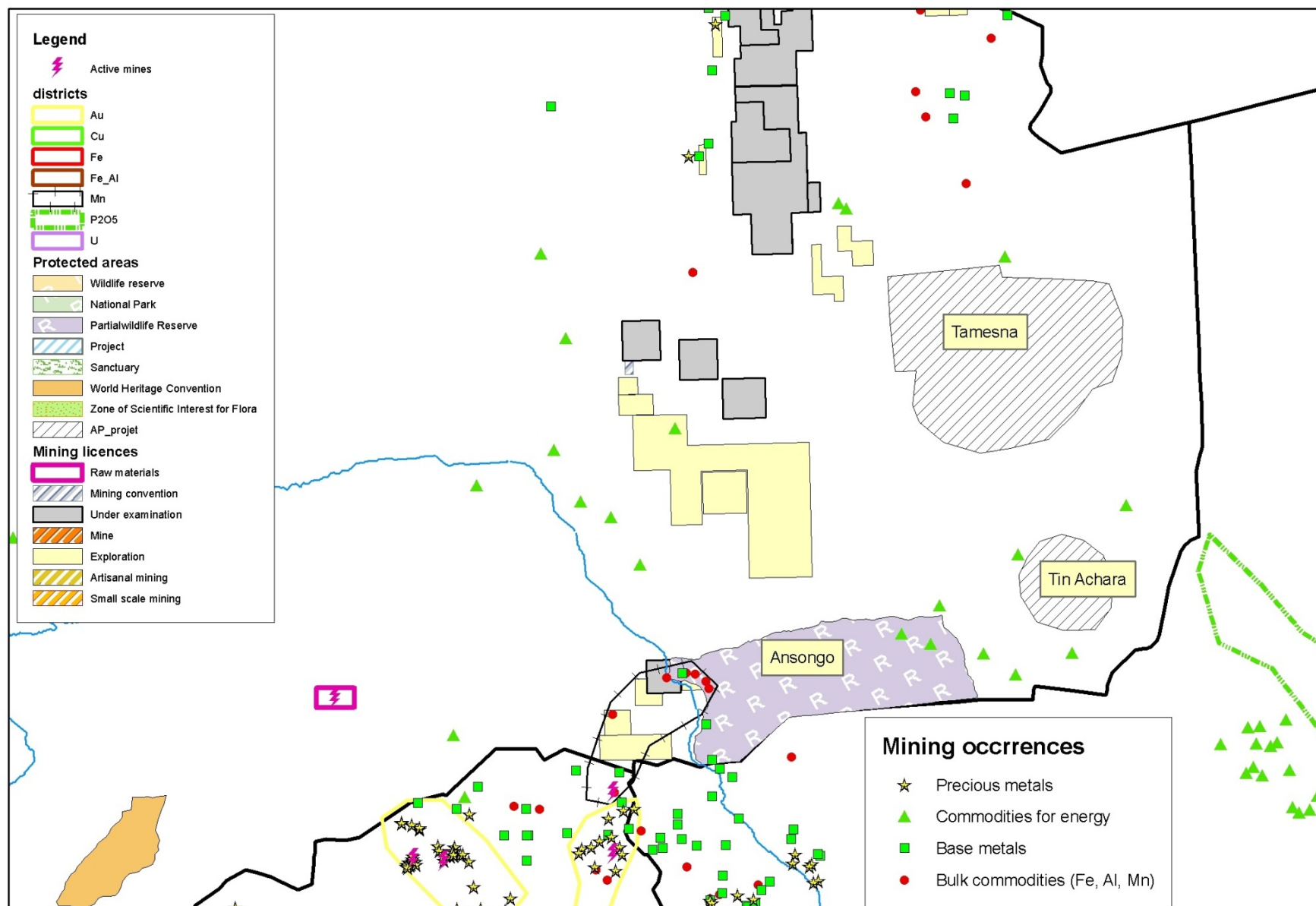
Some PAs in the east are subject to significant threats, but they are probably not of great value in terms of biodiversity (Douentza, Ansongo).

In the west, there is more biodiversity, although it is already subject to significant stress, but the plans to extend PAs in this sector will come up against the presence of large mines.

## References

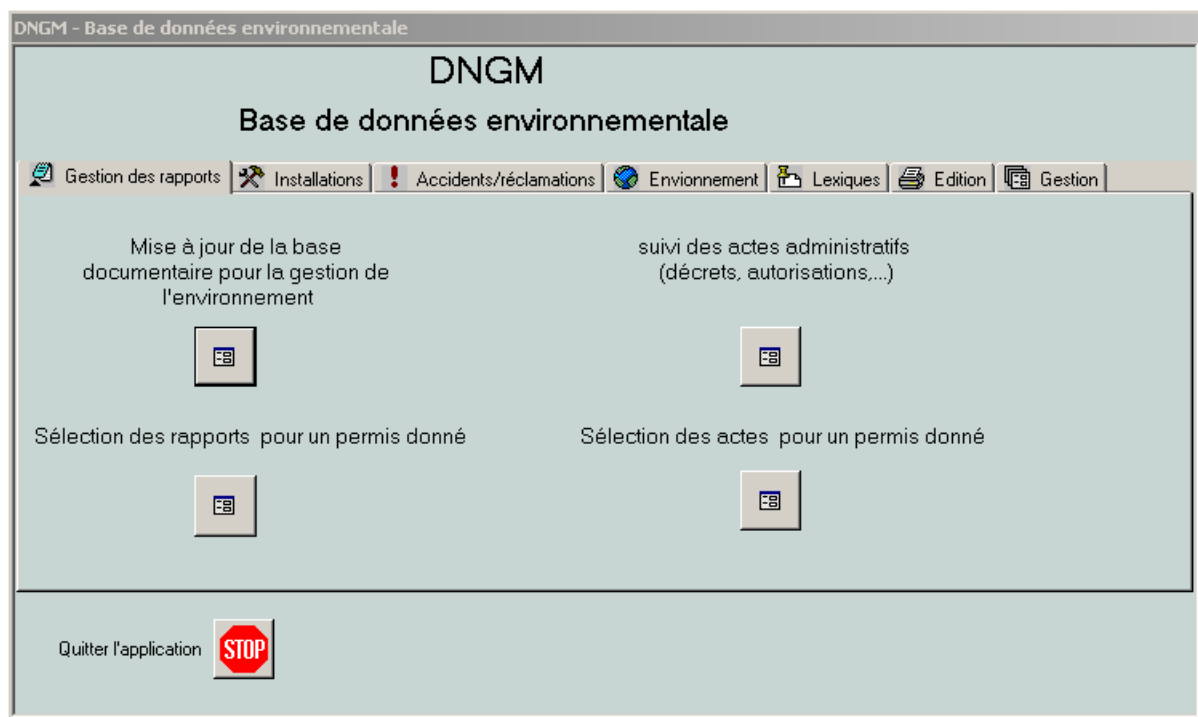
- Decree 99-255/P-RM dated 15/09/1999 which sets the terms and conditions for application of *Ordonnance n° 99-032/P-RM* dated 19 August 1999 on the mining law in Mali
- *Ordonnance n° 99-032/P-RM* dated 19 August 1999 on the mining law in Mali
- Decree 03-594/P-RM dated 31/12/2003 relative to the execution of Environmental Impact Assessments
- Appendix to Decree 03-594/P-RM setting the list of projects subject to an Environmental Impact Assessment
- Law 01-020 dated 30/05/2001 relative to pollution
- Law 00-27/P-RM dated 22/03/2000 on land laws
- Law 86-42/AN-RM on forest law
- Law 95-004 dated 18/01/1995 setting the conditions for managing forest resources
- Decree n° 00-22/P-RM dated 19/01/2000 setting the terms and conditions for classifying forests, reforestation areas and PAs within government forests.
- Law 95-031 dated 20/03/1995 setting the conditions for managing wildlife and its habitat.



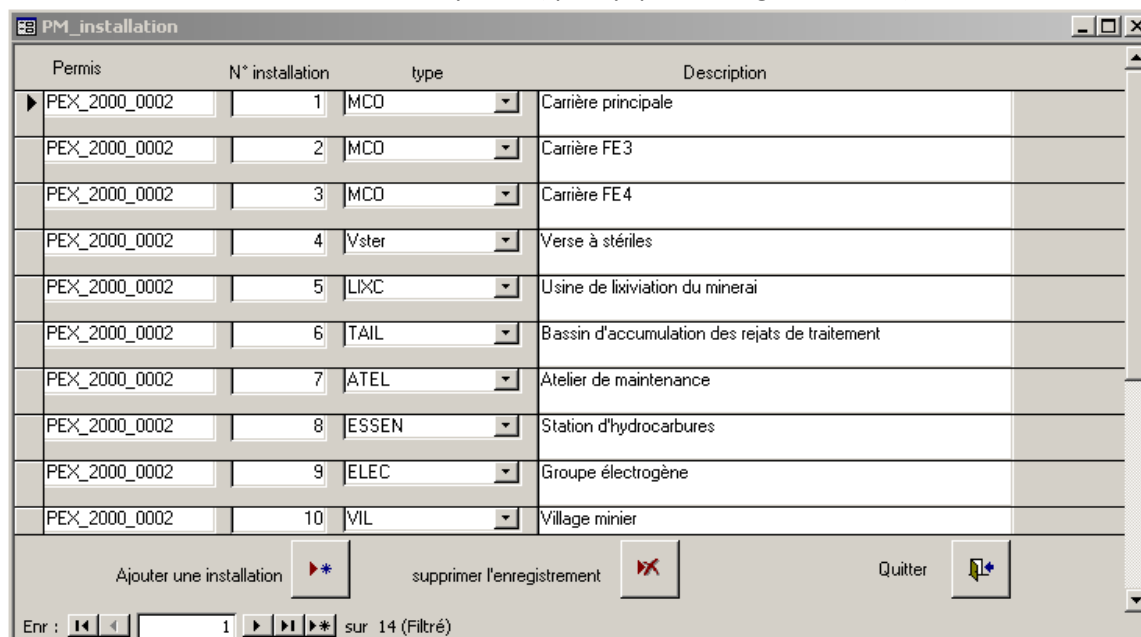


## APPENDIX: Environmental database of the DNGM

1. General overview of options proposed by the application: all the reports and administrative documents relating to a given permit can be managed, and all environmental data can be entered.



2. Description of the installations on mining sites: each mine can describe in detail the installations or structures they have (quarry, pits, tailings dams etc.)



- Management of environmental monitoring data: this includes monitoring accidents, claims and measuring stations. The types of discharge as defined in the EIA can be entered as can inventories of biodiversity.

DNGM - Base de données environnementales et minières

## DNGM

### Gestion des données environnementales minières

documentation Installations Accidents/réclamations Environnement Lexiques Edition Gestion

Stations de monitoring		<i>visualiser et compléter les données sur des stations de monitoring existantes</i>
Ajouter une station de monitoring :		<i>créer une nouvelle station de monitoring pour un permis donné</i>
Rejets prévus dans l'EIE :		<i>saisir les objectifs de rejet tels que définis dans l'EIE</i>
Saisir un inventaire de biodiversité :		<i>Saisir la liste de la faune et de la flore répertorié à une date donnée pour un permis donné</i>

Quitter l'application

- Different monitoring stations can be entered with their geographical location, the type of environmental monitoring (water, air, soil etc.), the frequency of measurements as set forth in the EIA:

PROJET\_MINIER\_STATIONS

Número Permis:  NOM\_PROJET\_MINI:

SF\_POINT\_MESURE

Identifiant Station	Nom de la station de mesure	Type Monitoring	DATE CREATION	Coordonnées géographiques	Fréquence mesures EIE	description	Données EIE Ajouter Voir	Monitoring Ajouter Voir	Installations Ajouter Voir
65	sortie groupe electrog	rejets atmosphérique		Long: <input type="text" value="0"/> Lat: <input type="text" value="0"/>					
*	[numéroAuto]			Long: <input type="text" value="0"/> Lat: <input type="text" value="0"/>					

Enr:  sur 1

- The readings from the monitoring stations can be entered, as well as who took the reading (government, mining company or NGO).

SSF_MONITORING						
	Date	substance	Valeur	Unité	Responsable mesure	Observations
▶	01/01/2009	Aldr	200	µg/l	Admin	premier test
	01/01/2009	Argil	200	%	ONG	premier test
*						

## PART I: REGULATION

### Protected Areas:

The officially recognised PAs (Forestry Law 1998) are:

- Classified forests: national forests classified for conservation, enhancement and soil regeneration purposes through appropriate management and protection. As part of the national forest, only local communities have certain rights (gathering of deadwood, fruit etc. livestock transit),
- Pastoral reserves: “natural formations where restrictions apply, particularly as regards industrial cropping in order to ensure utilisation of biomass is compatible with their wooded state”.
- Strict nature reserves: “areas constituting a collection that is representative of natural formations, classified for ecological or scientific reasons. All hunting, fishing, agricultural, mining, grazing or development activities are prohibited”.
- Special reserves: areas where for scientific, tourism or ecological reasons, certain temporary or permanent restrictions regarding hunting, fishing, capture of animals, use of vegetation or products from the ground or within it and infrastructure construction are necessary for scientific, tourism or ecological purposes.
- National parks: subject to restrictions or bans on hunting, capturing of animals, use of vegetation or products contained in the soil. No formal bans seem to be stipulated, and the original texts must be consulted to find out which activities are restricted.
- Reforestation and restoration areas: areas that are temporarily classified for protection, restoration or reforestation.

The law on forestry makes specific reference to mining:

- Article L44 specifies that “all mining operations, all exploration that damages the ground and forest formations are forbidden in classified forests, unless authorised by the Ministry for Water and Forests”. Outside classified forests, these activities must be authorised by the President of the Regional Council after deliberation by the rural council concerned. In all cases, authorisation is only granted after examination of a dossier containing a report from the Water and Forestry department, an EIA, an evaluation of the cost of restoration, an evaluation of the taxes to be paid before felling trees, a location map and map of vegetation, soil and surface waters, including runoff.
- The law also provides (Article R.42) that, in *départements* where state forests represent less than 20% of the area, requests for declassification can only be examined if they are accompanied by proposals to classify an equivalent area.

There are four national parks in Senegal: Niokolo Koba, Basse Casamance, Saloum Delta and Djoudji, even if the WDPA database only shows Niokolo Koba and Djoudji national parks.

Niokolo Koba National Park was created in 1954 (Decree of 4 August 1954) and enlarged in 1964 and again in 1968 with the addition of classified forests and a hunting reserve. It was not until 1976 that internal regulations strictly prohibiting the disturbance of wild animals and the gathering of non-timber forest products were created. The regulations also stipulate that it is forbidden to “take samples of earth or rocks or to carry out any public or private project without authorisation”.



According to a study carried out in 2001, Niokolo park lacks an official boundary to the north-east (corresponding to the boundary path).

In addition to the national parks, there are three wildlife reserves (Ferlo-Nord, Ferlo-Sud and Ndiael), a group of pastoral reserves in the centre-north of the country, four marine PAs (Saint Louis, Kayar, Joal and Abéné) and a great number of forest reserves. There is also a massive filao plantation on the northern coast called the “Filao Strip”. This strip is supposedly classified as a reforestation area, but this could not be confirmed.

Type of PA	Area
National park	9145 km <sup>2</sup>
Forestry reserve	10 842 km <sup>2</sup>
Marine PA	891 km <sup>2</sup>
Wildlife reserve	12 211 km <sup>2</sup>
Pastoral reserve	15 785 km <sup>2</sup>

Surface areas covered by the different types of PA in Senegal.

NB: the exact boundaries of the Filao strip could not be established, so it is not listed above.

## Law on the Environment

According to the Law of 2001 on the environment, classified installations are defined as being factories, workshops, depots, work sites, quarries, industrial, artisanal or commercial installations and all other activities that could constitute a danger to health, security, hygiene, agriculture, nature and the environment in general, or inconvenience the people living in the vicinity.

Such installations are classified either as Level 1 (serious danger or inconvenience), or Level 2. At Level 2, only the general requirements must be met. For Level 1, specific measures must be stipulated (following a public survey) in a ministerial by-law to prevent such danger or inconvenience. Authorisation to operate these installations is granted by the Minister for the Environment.

### Environmental Impact Assessments (EIA)

Sector guidelines for EIAs have existed since 2006. “Extractive and mining activities” are clearly on the list of projects for which an in-depth EIA is necessary. It is specified that activities to extract and process non-metal ore or minerals for energy production and the extraction of aggregates (marble, sand, gravel, shale, salt, potassium and phosphate) require an initial environmental analysis.

There are guidelines concerning the oil production and transformation industries, on exploration for oil deposits, on mining exploration, on quarries and on cement works.

Procedure: the TORs are submitted by the promoter, validated by the EIA division often accompanied by a site visit by the regional correspondents.

The assessment must be carried out by a consulting firm certified by the Ministry of the Environment (there is a list on the website, but it is not functional). The promoter must organise a public survey before handing in the impact assessment. An inter-ministerial technical committee presided over by the ministry responsible for the activity gives its ruling on the report and grants (or refuses) a provisional authorisation followed by a ministerial by-law. Once validated, the EIA is presented at a public meeting organised by the local authorities.

Exploration however, is not subject to an EIA, although activities such as the digging of large trenches can have an impact. For the exploration permit, the promoter often just obtains support from the

local authorities. The ministry is trying to set up a system to regulate this, so that EIAs can be carried out.

## Mining Law (2003)

The mining law requires EIAs for two types of mining licence:

- *The exploration phase includes in particular geological, geophysical, geochemical and mining work, chemical analyses, metallurgical tests and if necessary an economic feasibility study, as well as the drawing up of a programme to develop and mine any economically viable deposit found. It also contains a brief analysis of the initial state of the exploration site and its environment (Article 15),*
- *Any request for a mining permit or mining concession or small mine authorisation must include, at the promoter's expense, an environmental impact assessment in compliance with the law on the environment and associated by-laws (Article 83).*

Article 85 of the mining law also requires classified forests to be respected: *"mining licences granted under this Law must comply with the provisions of the Forestry Law, in particular those of Article L44".* Article 44 stipulates that *"any mining operations, any excavation that harms the land and forests are forbidden in classified forests unless authorised by the Ministry for Water and Forestry"*

The law of 2003 also set up a "mining site rehabilitation fund" defined in Article 84 as follows: *"Notwithstanding the obligations under Article 82, all holders of a mining licence must open and contribute to a trust fund in a commercial bank in Senegal. This account is intended to build funds to cover the cost of the rehabilitation programme"*.

No environmental obligations specifically pertaining to quarries are mentioned in the mining law.

## Analysis Problems

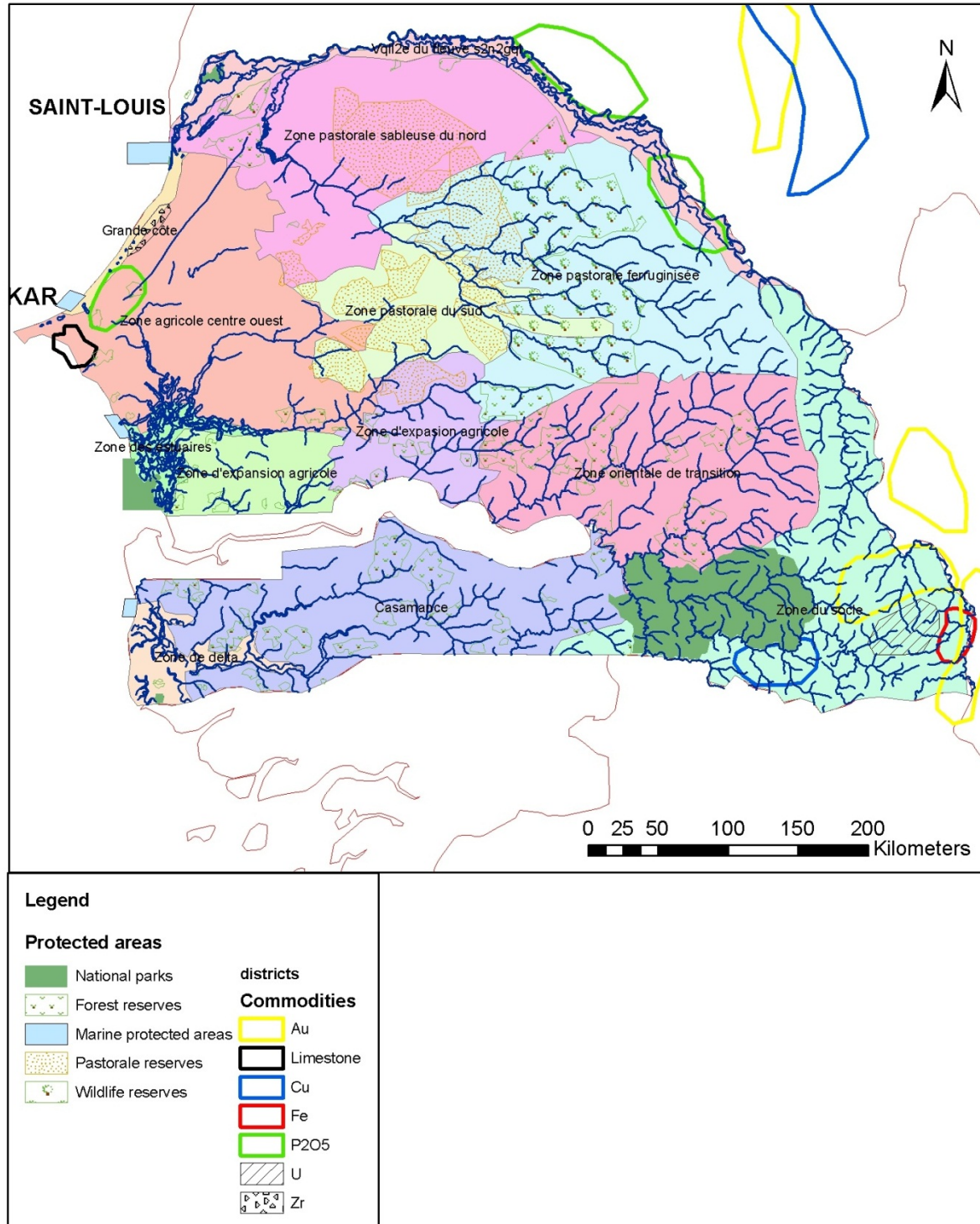
1. Although Article 85 of the mining law is clear (no mining licences in classified forests without authorisation from the ministry), it is difficult to apply, because the mining cadaster does not currently have a map of all PAs. Overlap between mining licences and PAs is discovered after the event by Water and Forestry agents.
2. Declassifications have been made, particularly in the phosphate district of Taïba-Thiès, without any equivalent classification measures being taken prior to the impact assessments.
3. Application of the by-law on the Niokolo-Koba national park amounts to: the park administration can authorise the opening of quarries...
4. Article 73 of the mining law stipulates that "possession of a mining licence confers a right of occupation (...) which includes authorisation to: (...) take the timber needed for the work. Thus it constitutes a right to fell trees exempt from the timber tax.
5. According to the law on the environment, quarries are subject to impact assessments, but they are not mentioned in the mining law.

## Remarks

The forestry law, which predates the mining law, contains specific provisions regarding the mining sector, which are for the most part repeated in the mining law. The law on the environment, which comes after both these, sets a general framework and specifies the terms and conditions for carrying out EIAs. Some reorganisation appears necessary: the forestry law should not specifically mention mining activities, but can lay down the general rules concerning forests, unless these are

defined in the law on the environment. The mining law should then simply refer to the law on the environment for all issues relating to EIAs or areas subject to special authorisation.

## Senegal : Ecoregions and mining districts



## PART II: MINING DEVELOPMENT AND THE ENVIRONMENT

### Geological and mining situation

In Senegal, only the border areas with Mali and Guinea are basement complexes. The rest of the area is a vast sedimentary basin.

- The basement complex contains gold occurrences and mines (zones used mainly for artisanal mining at the Malian border on Falémé and deposits in the Sabodala region) and uranium occurrences mainly at the Guinean border.
- The sedimentary basin is particularly known for its phosphate deposits and occurrences (mines are mainly located around Dakar). It also contains limestone, cement and clay for bricks. The 250km along the Atlantic coast are also covered by oil blocks that are being explored.

Senegal's main mining districts are:

- Kédougou gold district with the Sabodala mine
- The iron-ore district (Guinean-Malian border) with a project that is currently on stand-by with Arcelor-Mittal (700km of railway to transport the ore). If iron ore prices remain high, this district will end up being exploited (synergy with other deposits such as the bauxite in Guinea-Bissau, or liaison with the phosphates of Matam).
- Phosphate district of Thiès, main Senegalese mine
- Matam phosphate district
- Limestone district in Dakar (limestone for cement)

While Senegal has mainly phosphate, there has been considerable diversification of its mineral resources: the mine of Sabodala should soon be followed by two others, the iron ore project of Falémé and the zircon project of Niayes have passed the feasibility study stage and mining of resources such as decorative stone, limestone and marble should increase in the future, not to mention construction materials (cement limestone, sand) which are already heavily excavated in the Dakar region.

The rare economic data available on the mining sector in Senegal show:

- Annual production of slightly more than 1 million tonnes of phosphate,
- Annual production of around 2.5 million tonnes of cement limestone
- The Sabodala gold mine had 430 direct staff in 2010. Production for 2009 and 2010 is around 5 tonnes of gold. Two new gold mining projects could start up around Sabodala by 2013-2014.

### Knowledge of Biodiversity

The most studied area in Senegal is without a doubt Niokolo-Koba National Park, where new species of grass and also woody plants were recently discovered.

In the context of the PGIES project (integrated ecosystem management project), studies have been carried out on the distribution of several species of vegetation considered to be endemic. At the same time, the project has set up 19 community-managed nature reserves.

Note that according to the specialists, the list of protected species given in the regulations is not realistic (some species on the list are actually very common, and some truly endangered species are not on it).

## Mining Pressure on the Environment

The National Action Plan for the Environment (1997) highlighted the following problems regarding mining:

*“The irrational operation of quarries can cause multiple problems: soil degradation, deforestation, air pollution etc. Over-exploitation of sand and salt from Retba lake could cause the sea to encroach on the continent and eventually cause the lake to disappear.”*

The RAPPAM evaluations indicate the risk of pollution in Niokolo-Koba National Park: pollution of the water by cyanide and sound pollution from the explosions for exploration. Note that the gold mines are located more than 30km to the east of the Niokolo-Koba boundaries, which limits the risks of pollution, although part of the mining area drains to the west via a river that flows through the park. A quarry for crushed rock is also mentioned within the Niokolo, not far from the northern boundary track, i.e. where the boundary is not legally clearly defined.

## Geographical Analysis

According to the mining data available, there are numerous mining pressure risks hanging over the different PAs. The most significant are:

- Niokolo Koba National Park: There is a phosphate occurrence, a cobalt occurrence, a tin occurrence and a molybdenum occurrence within the park, but these occurrences do not offer mining potential. Pressure on the park comes from outside: a good part of the gold district (including the Sabodala mine) is located at the head of the catchment of the Niokolo River which flows through the park. The 30km separating the mine from the park protect the latter against disturbances such as noise and vibrations, but any accidental polluting by the mine would affect the park. Another consequence of this geographical situation is the presence of gold downstream from the mine, where there is considerable artisanal gold mining activity, particularly in the forests along the river banks, forests which are clearly rich in biodiversity.
- The marine PA of Kayar is directly downstream from the phosphate mines and is affected by the discharges.
- The marine PA of Saint Louis, in the mouth of the Senegal River, is downstream from the phosphate deposits of Matam and the Kédougou gold district.
- The reforestation area of Niayes is adjacent to a Zircon concession and many known peat occurrences. Projects to use peat to replace firewood have been under examination for several years.

While of lesser importance, the following can also be mentioned:

- The Saloum Delta and the Joal marine PA: two phosphate occurrences and a cement limestone occurrence,
- St Louis marine PA: occurrences of brick clay and a peat occurrence,
- Six Forages pastoral reserve: Three phosphate occurrences,
- Ferlo wildlife reserve: an undocumented uranium occurrence at the boundary between Ferlo North and Ferlo South.

The most sensitive areas are clearly the marine PAs and the Saloum delta, should oil be discovered off shore or along the coast.

### Impact Assessments

Several impact assessments were available at the Ministry for the Environment. Without giving a detailed critical analysis, it can be noted that they are of a generally high standard, perhaps thanks to the obligation under the law on the environment to use a nationally certified consulting firm. However, two major comments should be made:

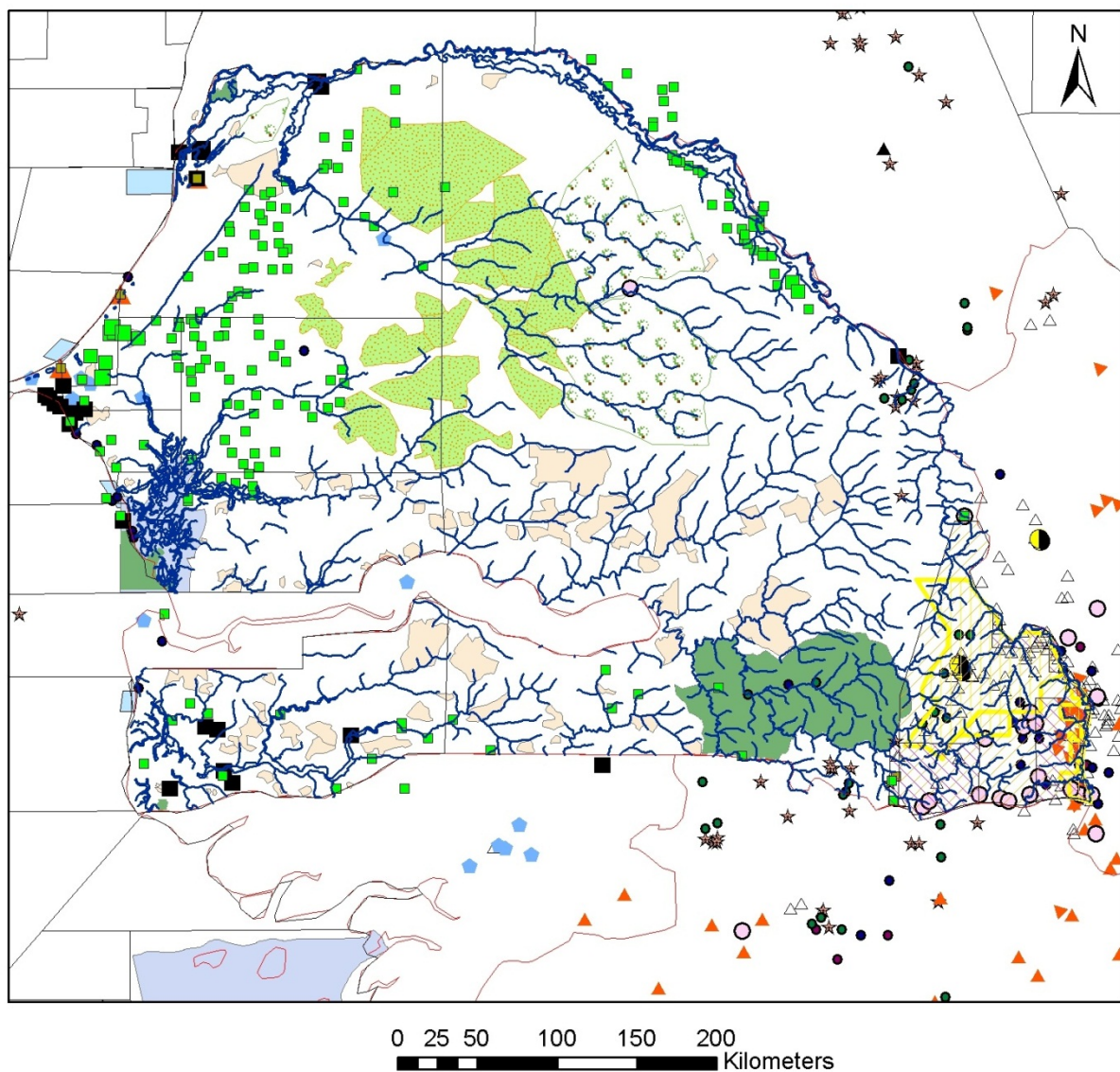
- The particularities of the mining sector are not sufficiently taken into account (for instance, there is no analysis of cadmium, lead or uranium on a phosphate project, and no analysis of arsenic or selenium on a gold mining project),
- The natural environment is taken into account, but biodiversity is rarely mentioned.

### References

- Law on the Environment: 2001-01 of 15/01/2011 and Decree 2001-282 of 12/04/2011
- Forestry Law: 98/03 of 08/01/1998 and Decree 98/164 of 20/02/1998
- Mining Law: 2003-36 of 24/11/2003
- Oil Law: 98-05 of 08/01/1998
- Decree of 4 August 1954 on the transformation of three strict wildlife reserves in West Africa into national parks
- Decree 65-684 of 13/10/1965 on the enlargement of Niokolo Koba National Park
- Decree 68-551 of 14 May 1968 on the enlargement of Niokolo Koba National Park by the addition of the zone of the “boucle du Damantan”
- By-law 007163/PM/DGT of 24 June 1976, on the internal regulations for Niokolo Koba National Park
- National Action Plan for the Environment (1997)
- National Action Plan for climate change adaptation (2006)
- <http://www.denv.gouv.sn> (site of the Environment Directorate and classified installations)
- <http://www.dirmingeol.sn> (website of the Mining Directorate)



# Senegal : Protected areas and mining activities



Legend		
Hydrocarbon licences	agroindustrial commod.	Limestones & clay
<b>Mining licences</b>	Peat	Raw materials
Au	Phosphate occur.	<b>Energy commodities</b>
Diam	Phosphate deposits	Peat
U	indust. mines of P2O5	U
	<b>Precious metals</b>	<b>ferrous metals</b>
	△ Au, Ag occur.	Al
	● indust. gold mines	Fe
	✚ Artisanal gold mines	Mn
	● Heavy metals	Other commodities
		★ Base metals

Protected areas	
■	National parks
■	World heritage
■	RAMSAR areas
Other protected areas	
■	Forest reserves
■	Marine protected areas
■	Pastorale reserves
■	wildlife reserves

## GHANA

In Ghana, mines and PAs are governed by the same ministry (Ministry of Land and Natural Resources). The mining sector is governed by the “Minerals Commission” and PAs are under the control of the Forest Commission, divided into a Forest Division and a Wildlife Division).

Ghana also has an Environmental Protection Agency (EPA), a public body under the authority of the Ministry for the Environment, but which has decision-making authority and financial independence. The EPA is responsible for all environmental aspects, particularly all aspects concerning EIAs such as validation of TORs, granting of environmental permits and the publication of guidelines and standards for carrying out these EIAs. The EPA has a special mining department.

## Environmental Laws

### General Framework

The laws on the environment, classified forests and wildlife protection are fairly complex: since the first laws were passed in the 1960s, many amendments have been made and no summary documents exist to date. Therefore it is usually necessary to consult various texts to obtain all the pertinent information.

No document clearly defining the different types of PA could be found. Only forest reserves are clearly identified and it is specified that no activities affecting the ground can be carried out there (Timber & trees act, 1974, article 14):

A person who is not exercising rights under a concession and who, in a PA without the written consent of the Minister:

- (a) fells, uproots, lops, girdles, taps, injures by fire or otherwise damages a tree or timber, or
  - (b) makes or cultivates a farm or erects a building, or
  - (c) sets fire to grass or herbage, or kindles a fire without taking due precautions to prevent its spread,
- commits an offence and is liable on summary conviction to a fine not exceeding one thousand penalty units or to a term of imprisonment not exceeding five years or to both.

The key point of this article is the “without the written consent of the Minister”. For reasons of national strategy, certain mining licences have been granted to mining companies both in gold zones and to develop the aluminium industry, both deemed strategic for the country. At the same time, the EPA published specific environmental procedures for mining in forest reserves.

### Protected Areas

In Ghana, PAs are:

- forest reserves, managed by the Forestry Division
- wildlife reserves or game reserves, managed by the Wildlife Division

Certain areas may have dual status – forest reserve and wildlife reserve. National parks do not have a very clear status and seem to be accorded one or other of these two definitions, but we did not find documents to clarify their status.



Ghana has eight national parks, six resource reserves, two wildlife sanctuaries, one strict nature reserve and five coastal wetland zones (Ramsar convention), according to the Forestry Division, even if the status of these different areas does not appear to be very clear in the documents consulted. To this can be added a large number of forest reserves (around 200 are identified on the mining licence map).

While mining licences can be granted in forest areas, exploration is strictly forbidden in wildlife reserves.

## Mining law and relative acts

The first document to mention concerning mining laws is the constitution of Ghana of 1992. In Chapter 21, Article 257, it states that:

*“Every mineral, in its natural state in, under or upon any land in Ghana, rivers, streams, water courses throughout Ghana, the exclusive economic zone and any area covered by the territorial sea or continental shelf is the property of the Republic of Ghana”.*

In the following articles, the constitution establishes the principle for setting up different “commissions” (Land, Forestry and Mining).

The Mining Act of 2006 stipulates the rules for granting mining licences. Unlike the French-speaking countries, Ghana is divided into blocks of 15” by 15” (approximately 400 x 400 m) and each block is either free, reserved for a PA (forest reserve, wildlife reserve or national park), reserved for artisanal and small-scale mining (ASM) or attributed to a mining company. Therefore, theoretically there is no risk of overlap between mining licences and PAs unless a deliberate decision is made by the ministry for natural resources. This has happened on several occasions, either to install gold mines or to develop the bauxite industry. In these cases, specific environmental obligations are established by the EPA (note however that the document relating to mining in protected forests could not be obtained from the EPA).

Mining licences are granted according to a process of double public consultation: the mining licence request is firstly examined by the Minerals Commission which checks the availability of the area in the field and on the cadaster. If there are no impediments, the request is officially published for 21 days. If no comments are made, the applicant can then request an environmental permit from the EPA: they must submit the terms of reference approved by a commission including representatives from the EPA, the Minerals Commission and the Water Commission (the Forestry Commission is not yet included but should be shortly), then carry out the EIA which must include a public consultation. The EIA is then examined by the same mixed commission before receiving or being refused EPA approval.

The second public consultation is managed by a panel of three, two of whom are from the local communities and the third from the EPA.

The attribution of a mining licence is therefore both a public and an inter-ministerial act.

## The Extractive Industry in Ghana

Ghana is the largest gold producer in West Africa, with more than 60t produced annually (up to more than 80t in 2008).

The mining industry contributes to 5% of the GNP and totals more than 30% of all exports (of which more than 90% due to gold).

Exports	1984	1990	1995	2000	2001	2002	2003	2004	2005
Gold (US\$)	103.3	201.6	647.3	702.0	617.8	689.1	830.1	840.2	945.8
Total minerals exports (US\$)	115.3	242.3	678.9	756.0	691.4	753.9	893.6	880.0	995.2
Total exports (US\$)	567.0	896.7	1,431.2	1,936.3	1,867.1	2,015.2	2,602.6	2,739.2	2,836.2
Mineral as % of exports	20.34	27.02	47.44	39.04	37.03	37.41	34.33	32.1	35.1
Gold as % of total exports	18.22	22.48	45.23	36.26	33.09	34.19	31.90	30.7	33.3
Gold as % of all minerals	89.59	83.20	95.35	92.87	89.36	91.40	92.90	95.5	95.0

Contribution of the mining sector to gross export value (1984–2005)

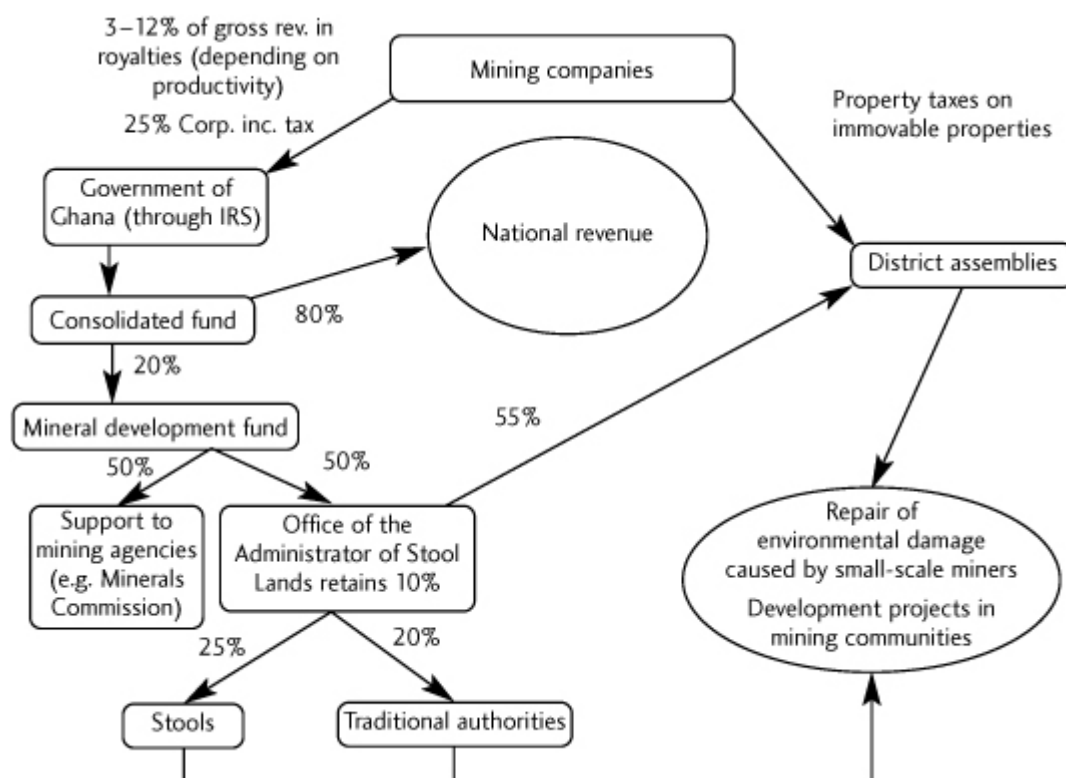
Source: Minerals Commission (2007).

Ghana also produces bauxite, manganese and diamonds (there are 23 “large mines” operating and 300 small mines are registered).

Ghana also produces natural gas and oil off shore.

Mining royalties are distributed as follows:

- 80% for the national budget
- 20% for the mining development fund, created to promote mining sector development and to compensate for the negative effects of mining on local communities.
  - o 50%: mining sector development and support for academic institutions
  - o 50%: district assemblies and traditional authorities in mining areas



Source: after Botchie et al. (2007).

## Impact of the extractive industry on protected areas and biodiversity.

Many articles, NGO studies and scientific studies have focused on the impacts of the extractive industries:

### Africa Action:

"Mining in forest reserves also contravenes the principles underlining the establishment of forest reserves in Ghana. The 1994 Forest and Wildlife Policy of Ghana aims at 'conservation and sustainable development of the nation's forest and wildlife resources for the maintenance of environmental quality and perpetual flow of optimum benefits to all segments of society'. Mining especially surface mining in forest reserves have no place in this policy objective because surface mining does not conserve, sustain the use of nor preserve biological diversity, water resources and the environment. By removing the entire forest biomass (plants and animals) biodiversity is lost, water cycle function of the forests is lost, local climate for agricultural production is seriously distorted, headwaters of streams and rivers get vanished with consequent distorted effects on domestic and industrial water supplies even in remote settlements. If these are some of the adverse effects of surface mining in forest reserves of which Ghana seeks to protect through Forest Certification, then a clear contravention is established by any attempt to permit mining in forest reserves".

"The forest reserves in question include: Subri River Forest Reserve, a globally important bio-diversity area which is also the largest forest reserve in the country. It is also a critical watershed between major rivers -Rivers Bonsa and Pra. Others are the Supuma Shelterbelt; Opon Mansi Forest Reserve in the Western Region; Tano-Suraw and Suraw Extension also in the Western region; Ajenjua Bepo

Forest Reserve in the Eastern region; Cape Three Points Forest Reserve in the Western region and the Atewa Range Forest Reserve in the Eastern region.”

“Chirano Goldmines Limited, Satellite Goldfields Limited, Nevsun/AGC, Birim/AGC and Newmont Ghana Limited are the companies fronting to mine in these reserves”.

“Forest reserves have important environmental and ecological linkages. They are linked to water and soil resources, genetic resources of plants and animals and to food production and food security. In particular they constitute a major source of fresh water bodies for domestic and industrial use and enhance local climatic conditions for agricultural production. In Ghana most freshwater bodies take their source from forested areas. For example, rivers Ankobra and Suraw take their source from the Tano-Suraw forest reserve, which also protects river Tano that passes through it. Clearly, if this reserve is being considered for mining then we are being confronted with serious livelihood and environmental consequences in a much larger magnitude. Forest reserves are also important to the economic and social-cultural relationship of rural communities and the nation as a whole. They create jobs, provide health and food security and help in the cultural identity of a people. It is for these and many other important reasons that Ghana Government has committed herself to several international conventions and has also enacted various legislation to protect and conserve forests and forest resources.”

“In spite of the important role that forest reserves play they have been undergoing qualitative and quantitative deterioration over the years. Already, much of the original vegetation of the country has been removed or considerably deteriorated. The size of existing forests and forestry resources and their adequacy for supplying critical goods and environmental influences necessary for the continued viability of local production is dwindling year after year. The nation's total forest cover has reduced from the 8.2 million hectares around 1900 to less than 1.6 million hectares as at now, which is even less than the initial 1.76 million hectares reserved as permanent forest estates. Out of the 1.6 million hectares, only 32,000 hectares representing 2% of the remaining forest reserves is said to be in excellent condition.”

#### **Ghanaweb:**

“Gold, a mining resource, buried deep under the forest reserve of Ghana, is to be mined only after getting all stakeholders (government, citizens, shareholders, environmentalists, mining companies) to agree on the most effective means of exploitation to minimize the negative impact of mining on the environment. A plan of action for effective mineral development requires broad objectives of ensuring optimal use of indigenous land to stimulate rural development for the benefit of the locals and shareholders”.

“The reported granting of mining leases in the Ghanaian forest reserve to some international mining companies can only be justified with a detailed study of the impact on the environmental, legal, social, political and other sectors. Such a report should be in the public domain for all to review and evaluate for a public discussion on the pros and cons of the exploitation of the mineral resources”.

#### **AKOBEN Programme:**

The AKOBEN, programme, led by the EPA, consists in rating the environmental performance of mining and manufacturing industries. There is a five level rating system. The levels are colour-coded, gold (for excellence), green, blue, orange and red (for poor performance levels). The rating is revised

and published annually. The final rating takes into account more than 100 indicators including qualitative and quantitative data, thus measuring companies' compliance with their obligations as set forth in their EIA. It is therefore a quantified and public environmental monitoring system.

<b>AKOBEN RATING SYSTEM</b>		
<b>Rating Level</b>	<b>Performance</b>	<b>Implications</b>
<b>RED</b>	<b>POOR</b>	<b>Serious Risks</b>
<b>ORANGE</b>	<b>UNSATISFACTORY</b>	<b>NOT in Compliance</b>
<b>BLUE</b>	<b>GOOD</b>	<b>In Compliance</b>
<b>GREEN</b>	<b>VERY GOOD</b>	<b>Applies Best Practices</b>
<b>GOLD</b>	<b>EXCELLENT</b>	<b>Committed to Social Performance</b>

Mining company results for 2010:

Company	1. Legal Issues	2. Haz. Waste Mngt	3A. Toxics Releases	3B. Non-Toxics Releases	4. Monitoring and Reporting	5. Env. Best Practices	6. Community Complaints	7. Corporate Social Respons.	<b>Final Rating</b>
ABOSSO GOLDFIELDS LIMITED--DAMANG	BLUE	BLUE	BLUE	BLUE	ORANGE	ORANGE	GREEN	GOLD	ORANGE
ANGLOGOLD ASHANTI (IDUAPRIEM) LIMITED--IDUAPRIEM	RED	RED	RED	ORANGE	ORANGE	ORANGE	NOT ADEQUATE	GOLD	RED
ANGLOGOLD ASHANTI LIMITED (OBUASI MINE)--OBUASI	BLUE	RED	RED	ORANGE	ORANGE	ORANGE	GREEN	GOLD	RED
CHIRANO GOLD MINES LIMITED--CHIRANO	BLUE	BLUE	NOT APP	BLUE	ORANGE	BLUE	GREEN	GOLD	ORANGE
GHANA BAUXITE COMPANY LIMITED--AWASO	RED	RED	NOT APP	BLUE	ORANGE	ORANGE	NOT ADEQUATE	NOT ADEQUATE	RED
GHANA MANAGANESE COMPANY LIMITED--NSUTA	BLUE	BLUE	NOT APP	BLUE	ORANGE	BLUE	NOT ADEQUATE	GOLD	ORANGE
GOLDEN STAR (BOGOSO/PRESTEA) LIMITED--BOGOSO	BLUE	BLUE	RED	BLUE	ORANGE	ORANGE	NOT ADEQUATE	NOT ADEQUATE	RED
GOLDEN STAR (WASSA) LIMITED--AKYEMPIM	BLUE	BLUE	RED	BLUE	ORANGE	BLUE	NOT ADEQUATE	GOLD	RED
GOLDFIELDS GHANA LIMITED (TARKWA MINE) --TARKWA	RED	RED	RED	ORANGE	ORANGE	BLUE	NOT ADEQUATE	GOLD	RED
NEWMONT GHANA GOLD LIMITED--KENYASI	BLUE	RED	BLUE	ORANGE	ORANGE	BLUE	NOT ADEQUATE	GOLD	RED
PRESTEA SANKOFA GOLD LIMITED--PRESTEA	RED	RED	NOT APP	ORANGE	ORANGE	NO DATA	NO DATA	NO DATA	RED

Waste management, and environmental monitoring and reporting are the two weakest points for all mining companies.

## Geographical Analysis

The map of mining licences shows the boundaries of PAs. If these boundaries are superimposed on those provided by the WDPA, there are a certain number of discrepancies:

- Difference in the boundaries of some areas: probably related to a problem in the system of projection
- The extension of many PAs is lower on the permit map than that of the WDPA



- Some areas in the WDPA are not on the mining licence map (including Digya National Park for instance)

## Ghana: Protected areas

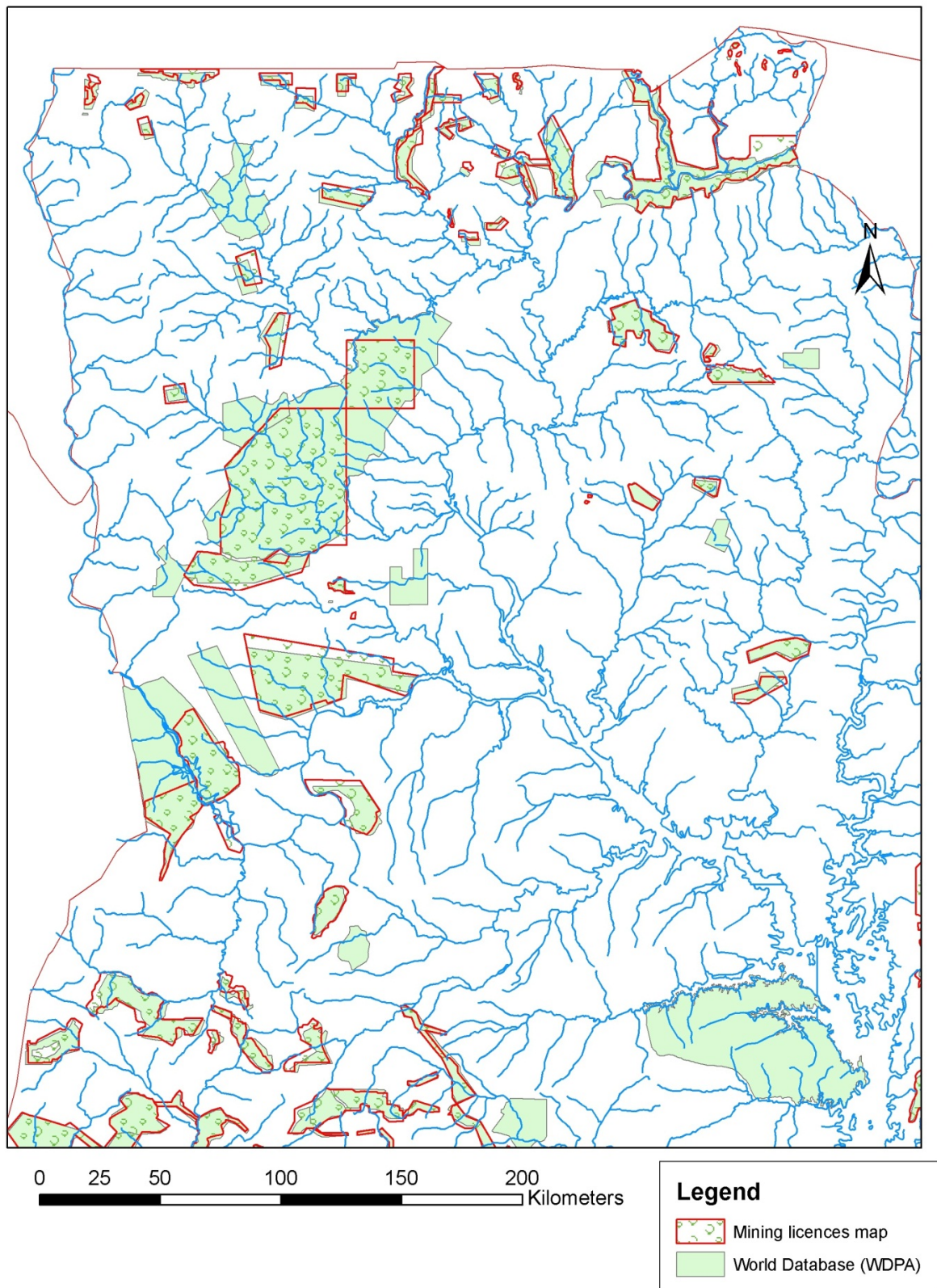


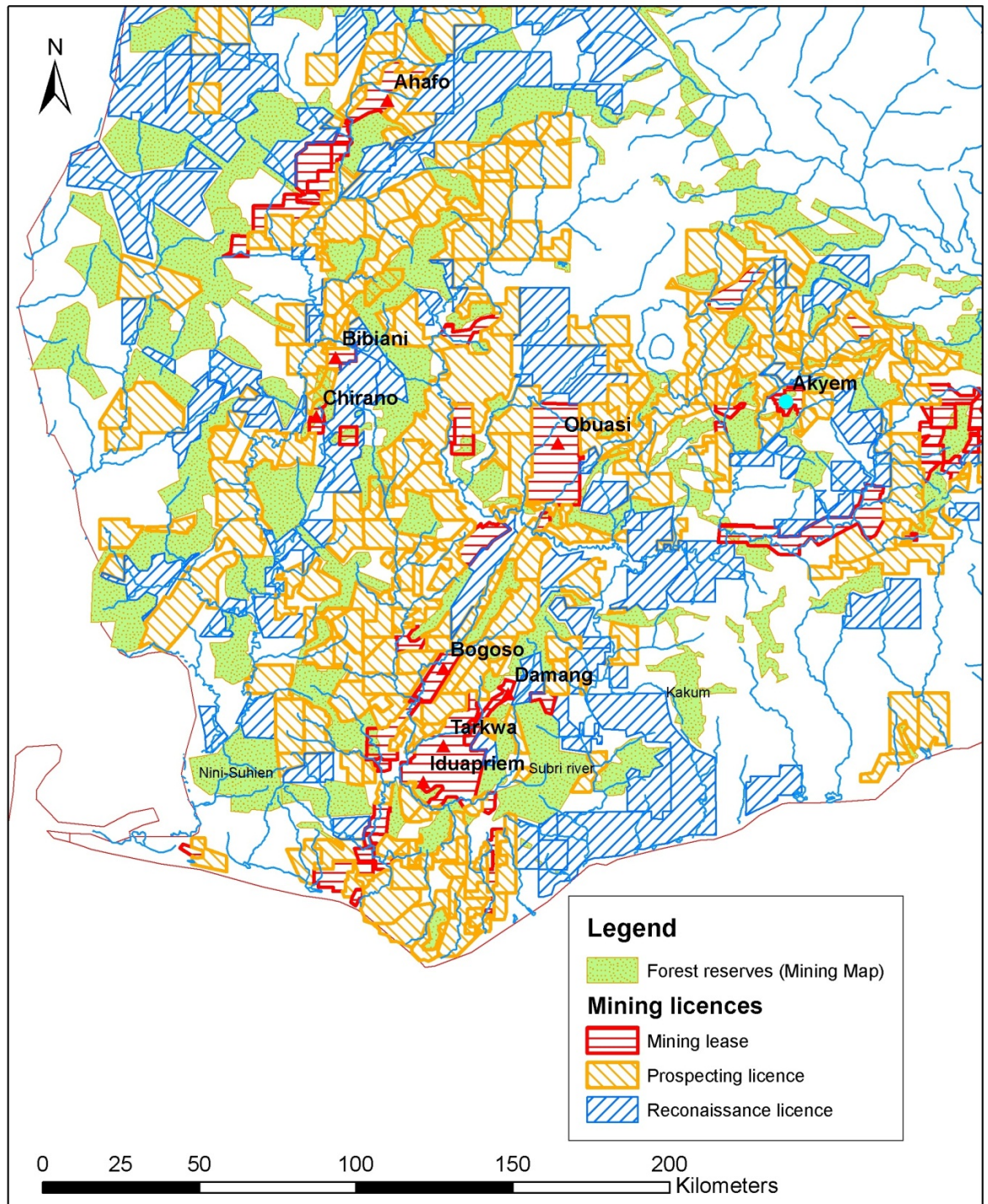
Figure above: Superimposition of PAs of the WDPA and the mining permit map.



The application of the rules for not granting mining licences in PAs is based on the PAs identified on the mining permit map.

This can be seen on the map, even if almost all the PAs are totally surrounded by mining activities.

## Ghana: Protected areas and mining licences

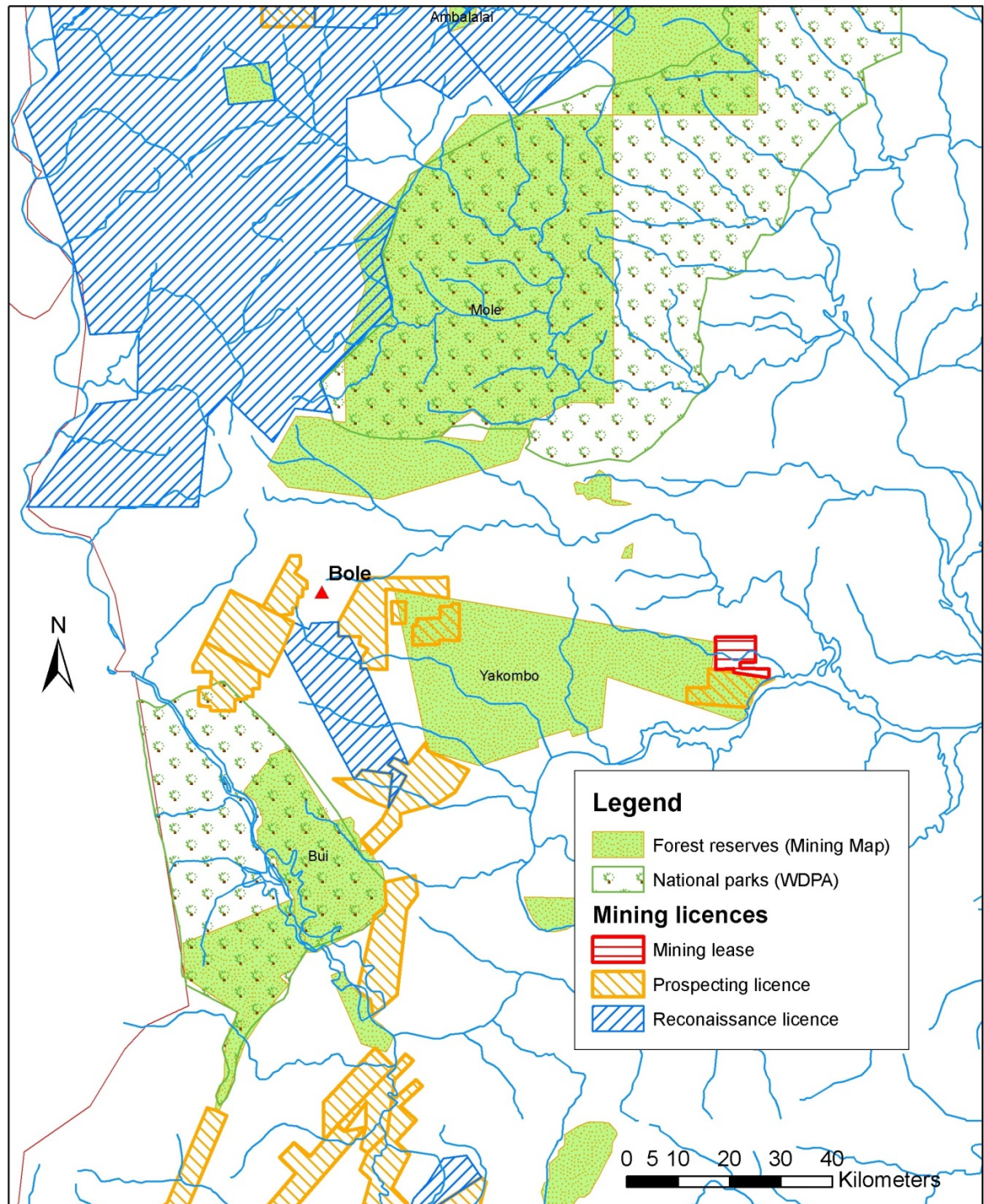


According to the Forest Commission and the Minerals Commission, there are five mining companies that have been authorised to hold mining licences within PAs. According to the



map, there is somewhat more overlap, but this is perhaps due to the problems in outlining PA boundaries. The example of Mole National Park is interesting in this regard: the reconnaissance licences granted in the North-West respect the park boundaries as defined in the WDPA and not those on the mining map. This is not the case for Bui national park, the northern part of which according to the WDPA is partly covered by a prospecting licence.

## Ghana: National parks and mining licences





Apart from Kyabobo and Digya National Parks, located in the sedimentary zone and which have no nearby mining activity, the other parks (Mole, Bui, Kakum, Bia and Nini-Suhien) are all bordered by mining licences with different effects:

- Kakum: reconnaissance licence downstream from the park
- Bia: prospecting licence downstream from the park
- Nini-Suhien: reconnaissance licence and prospecting licence upstream from the park
- Bui: prospecting licence upstream and downstream from the park
- Mole: reconnaissance licence upstream from the park. Part of Mole Park is located in the Bole gold district.

### **Study of some Environmental Impact Assessments**

The EIAs are available at the EPA. They are of very varying quality, some barely mention flora and fauna-related aspects (Chirano Gold Mine or Awaso bauxite for instance), others constitute in-depth local reports, covering much more than what is required for the mining licence (Newmont and Golden Ridge project for example). Regarding the latter, the wildlife, plant and ecosystem inventories are worthy of use elsewhere.