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TOWARDS
RESPONSIBLE
ARTISANAL
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SCALE MINING



Estelle Levin Ltd.

REPORT

**JULY
2012**



ARTISANAL AND SMALL-SCALE MINING IN AND AROUND PROTECTED AREAS AND CRITICAL ECOSYSTEMS PROJECT (ASM-PACE)

GABON CASE STUDY REPORT

A Situational Analysis of ASM in Protected Areas and Critical Ecosystems and Recommendations for Gabonese Policymakers to Attain Ecologically and Socio-Economically Responsive Artisanal and Small-scale Mining

FINAL REPORT BY MICHA HOLLESTELLE
JULY 2012

The aim of **ASM-PACE** is to address the environmental impacts of artisanal and small-scale mining (ASM) whilst building on its economic, social, and empowerment potential in some of the world's most important ecosystems. The project uses a scientific foundation of knowledge, participatory methods and rights-based approaches to work with miners and their communities – rather than in opposition – to design sustainable, win-win solutions that will last. The project is focused exclusively on ASM occurring in and around protected areas and priority ecosystems. For more information please visit www.asm-pace.org.

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- Promote the reduction of greenhouse gas emissions from deforestation and degradation of forests
- Support sustainable business practices and financial investments in development and infrastructure projects
- Improve the livelihoods of indigenous and local peoples
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ACRONYMS

ACP	African Caribbean Pacific
AGM or ASGM	Artisanal Gold Mining or Artisanal and Small-scale Gold Mining
AMZ	Artisanal Mining Zone
ANPN	<i>Agence Nationale des parcs nationaux</i> (National Park Agency)
ARM	Alliance for Responsible Mining
ASM	Artisanal and Small-scale Mining
ASM-PACE	Artisanal and Small-Scale Mining (ASM) in and around Protected Areas and Critical Ecosystems (PACE)
BGR	<i>Bundesanstalt für Geowissenschaften und Rohstoffe</i> (Federal Institute for Geosciences and Natural Resources)
BRICS	Brazil, Russia, India, China, South Africa
CN	Cyanide
CoC	Chain of Custody
CoP	Code of Practice
CPAET	<i>Convention Provisoire d'Aménagement-Exploitation-Transformation</i>
CSO	Civil Society Organization
CTC	Certified Trading Chains
DGMC	<i>Direction Générale des Mines et Carrières</i> (Directorate of Mines and Quarries)
DCMG	<i>Direction Générale des Mines et de la Géologie</i> (General Directorate of Mines and Geology)
DGRM	<i>Direction de la Géologie et Recherche Minière</i> (Directorate of Geology and Mining Research)
DRC	Democratic Republic of Congo
EHS	Environmental Health & Safety
EIA	Environmental Impact Assessment
EITI	Extractive Industries Transparency Initiative
ESER-ASM	Ecologically and Socio-Economically Responsive Artisanal and Small-scale Mining
EU	European Union
FC	Forestry Code
FDI	Foreign Direct Investment
FFI	Fauna and Flora International
FI	Financial Institution
FLO	Fairtrade Labelling Organisations International
FT/FM	Fairtrade and Fairmined Standard for Gold from Artisanal and Small-scale Mining, including Associated Precious Metals
GoGabon	Government of Gabon
GDP	Gross Domestic Product
HDI	Human Development Index
ICMC	International Cyanide Management Code
ICMI	International Cyanide Management Institute
ICMM	International Council of Mining and Metals
IFC	International Finance Corporation

ILO	International Labour Organization
IRMA	Initiative for Responsible Mining Assurance
MAB	Man and Biosphere Programme
MoM	Ministry of Mines
MOU	Memorandum of Understanding
NGO	Non-Governmental Organization
OECD	Organisation for Economic Co-operation and Development
OECD DDG	OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas
PA	Protected Area
PACE	Protected Areas and Critical Ecosystems
RJC	Responsible Jewellery Council
SAT	Service Assistance Technique
SIA	Social Impact Assessment
SMME	Small, micro and medium enterprises
SOGAREM	<i>Société Gabonaise de Recherche et d'Exploitation Minière</i>
SOGEMI	<i>Société Gabonaise d'Entreprise Minière</i>
SSC	Sustainable Supply Chain
SYSMIN	Mining Sector Support Programme
UN	United Nations
UNECA	United Nations Economic Commission for Africa
UNESCO	United Nations Educational, Scientific and Cultural Organization
USAID	United States Agency for International Development
USD	US Dollar
VET	Vocational Education Training
WCS	Wildlife Conservation Society
WWF	World Wide Fund for Nature, also known as the World Wildlife Fund
WWF-CARPO	WWF's Central Africa Regional Programme Office

GLOSSARY

Term	Definition
Artisanal and small-scale Mining (ASM)	Mining conducted with rudimentary tools such as picks and shovels or simple machinery, usually informal or semi-formal individuals or small groups of people on a subsistence basis.
Assurance	An evaluation method that uses a specified set of principles and standards to assess the quality on an organization's performance, the underlying systems, processes and competencies that underpin its performance, and/or the reporting thereof.
Concessions	Mineral exploration areas within which companies are granted rights to operate and derive revenues from that operation.
Consent	Refers to indigenous/local communities' consent to mineral exploration within their territory/habitation areas.
Consultation	Refers to stakeholder consultation, aimed at understanding how key stakeholders perceive the Standards' individual and relative strengths and weaknesses.
Critical Ecosystem	The site is not a protected area but it is a WWF Priority Place. OR The site affected is not a protected area or a WWF Priority Place, but <i>it is</i> in one of the Global200 Priority Ecoregions ¹
Cyanidation	Mineral processing technology of dissolving gold in a cyanide solution (cyanide leaching) and subsequent recovery of the gold from the solution by precipitation with zinc or through absorption on activated carbon and subsequent desorption. ²
Degazetting	Declassifying a protected area
Digger	A type of ASM labourer whose role it is to recover the mineral, clear vegetation and boulders, removing overburden and extracting and transporting gravel. Often confused with the term 'miner'.
Fair Mined	The Alliance for Responsible Mining (ARM) label, in conjunction with the Fairtrade Foundation's Fairtrade certification.
Fair Trade	Fair Trade minerals are those that, in conjunction with the Fair Trade Foundation, are certified that artisanal and small-scale miners receive a Fairtrade Minimum Price; receive a Fairtrade premium payment, which is democratically reinvested in community projects and improving miners' operations. This is calculated as 10 per cent of the applicable LBMA fixing); for Ecological Gold (gold extracted without the use of chemicals) the Fairtrade premium is calculated as 15 per cent of the applicable LBMA fixing; develop long term business relations with their commercial partners; have developed democratic and accountable organisations and formalised all their operations; are using safe working practices including the management of toxic chemicals, such as mercury and cyanide, used in the gold recovery process; are respectful of the environment; recognize the rights of women miners; and do not allow child labour in their operations. ³
Gazetting	Classifying a place as protected.
Gold-washing	Concentrating the gold using water and gravimetric methods, e.g. with a pan or sluice.
Industrial Mining	Often termed medium- or large-scale, done by professional, corporate outfits legally and in the pursuit of profit. High level of mechanisation and capitalisation; low labour intensity.
Miner	In the context of this report, the term 'miner' refers to any person involved in artisanal and small-scale mining. ⁴

¹ Olson & Dinerstein, 2002.

² ARM-FLO definition

³ See <http://www.fairgold.org/> for more information

⁴ ARM-FLO definition

Ore	Mineral (rock or gravel) which contains gold at an economic concentration (grade) and that is therefore suitable to be processed. ⁵
Protected Area	A location that receives protection because of its recognized natural, ecological and/or cultural values. There are different kinds of protected areas, which vary by the level of protection depending on the enabling laws of each country or the regulations of the international organisations involved. The term 'protected area' also includes Marine Protected Areas. ⁶
Regulation	A set of laws and rules imposed by a government, backed by the use of penalties that are intended specifically to modify the economic behaviour of individuals and firms in the private sector. ⁷
Standard	A set of officially approved principles and criteria designed to measure and safeguard specified social, environmental, and management issues in the industrial gold mining sector.
Tailings	Leftover material/waste from the mining process.
Toxin	An antigenic poison or venom of plant or animal origin, especially when produced or derived by microorganisms and causing disease when present at low concentration in the body.

⁵ ARM-FLO definition

⁶ See <http://www.protectedplanet.net/search/> for more information

⁷ Based on OECD

EXECUTIVE SUMMARY

Introduction

Artisanal and Small-Scale Mining (ASM) in Gabon is a long-practiced^{8,9} but frequently informal activity that can play a significant role in local development.¹⁰ However, it can also have negative impacts on the environment due to the mining practices and the presence of human settlements in sensitive environments.

In Gabon, the environmental stakes are particularly high. Gabon has the highest forest cover as a proportion of national surface area of any African country- its pristine forests have brought attention from global conservation organizations, and it has been dubbed the 'Green Heart of Africa'. Indeed, Gabon is home to five of the world's 200 Global eco-regions¹¹, nine Ramsar-listed sites¹², one World Heritage Site¹³, and WWF considers the whole country to be a conservation priority.

While artisanal and small-scale mining is frequently viewed with suspicion by those aiming to protect Gabon's precious resources, there may be space for pragmatism. As showcased in other parts of the world, ASM *can* be done in a responsible manner, minimizing negative social and environmental impacts. These expectations are termed "Ecologically and Socio-Economically Responsive Artisanal and Small-scale Mining" (ESER-ASM) in this report.¹⁴ Where ESER-ASM is achievable, it can be a desired economic activity contributing to income and local development, while irresponsible ASM is widely rejected by governments and the public.

The Gabonese government has expressed an interest in developing ASM in alignment with its 'Green Gabon' vision. This ASM-PACE report provides a situational analysis of Gabon's ASM sector, with a focus on ASM in Protected Areas and Critical Ecosystems (PACE).¹⁵ The report gauges to what degree ASM in Gabon is ecologically and socio-economically responsive and offers concrete steps to make it more so. Consideration is given to how and where the ASM is practiced, its legality, past efforts to make it more ESER, and other factors that determine the feasibility of incentivising more responsible ASM in Gabon, and in particular in protected areas and critical ecosystems. The report gives a general overview of ASM and conservation in Gabon, before presenting three case studies of ASM in PACE locations (Ndanguï, Longo, and Minkébé).

Key definitions

- Artisanal mining: Gabon's Mining Code defines artisanal mining (section 102, law 05/2000) as a method of operating with little or no mechanised aid, where "the driving force of water obtained on site and not transferred into hydroelectricity or a motor pump" are not to be viewed as mechanised.
- Small-scale mining: Defined by Article 107 of Gabonese law 05/2000 as: "All mining exploitation characterised by: A staffing of seventy (70) employees or more, all categories included; A production of a maximum of hundred thousand tonnes of minerals run of mine;" some other determinants to indicate small-scale mining: it is more organized, mechanised, productive and generally more advanced than artisanal mining.

While this definition of small-scale mining is significantly more precise than that of artisanal mining, there remains an apparent grey area for mining staffing less than 70 people.

⁸ Cinnamon, J., Counting and recounting in Northern Gabon, 2010 & Lahm, S. 2002

⁹ Lahm 2002

¹⁰ Often ASM is part of a diverse livelihood strategy at the individual and household levels helping build resilience and enabling families to better cope with seasonal and extraordinary stresses. Artisanal mining also employs many more people than industrial mining. Of the entire global minerals industry, 90 per cent of the mining labour force are artisanal miners. See Alliance for Responsible Mining (2010).

¹¹ These include Atlantic Equatorial coastal forest (AT0102), Central African mangroves (AT1401), Cross-Sanaga-Bioko coastal forests (AT0107), Northeastern Congolian lowland forests (AT0126), Western Congolian forest-savanna mosaic (AT0723). Source: Encyclopaedia of the Earth (a)

¹² Gabon did ratify the Ramsar Convention in 1987 and so far it has not recognised these protected areas in national law. On its website, the Ramsar Secretariat currently lists nine Ramsar Sites in Gabon.

¹³ Ecosystem and Relict cultural Landscape of Lopé-Okanda World Heritage Site

¹⁴ In this report, we avoid using the term 'sustainable mining' owing to the fact that minerals are non-renewable natural resources.

¹⁵ The ASM-PACE project recognises that some Protected Areas have little conservation value in actual fact whereas other unprotected sites could be judged as having high conservation value. Therefore we define protected areas as areas of high biodiversity value established as protected areas due to biodiversity conservation either under international conventions (e.g. IUCN-designated sites, RAMSAR sites, Areas of Zero Extinction), or by governments for at least partly biodiversity conservation (such as nature reserves or national parks). In addition, ASM-PACE defines an ecosystem as a 'critical ecosystem' if site affected is not within the boundaries of a protected area, but is located within a WWF priority place¹⁵ or is in one of the Global 200 Priority Ecoregions as described by Olson & Dinerstein, 2002.¹⁵

The aim of this report is to help decision-makers at the *Agence National des Parcs Nationaux* (ANPN, the Gabonese National Agency for the National Parks) the Gabon Ministry of Mines and Industry (MoM) and the state-owned Gabon Mining so that they can plan an early ‘roadmap’ towards ESER-ASM. While ASM-PACE can be a partner in such efforts, *if ESER-ASM is to be achieved and sustained in Gabon, action must be driven and owned by State-authorities with the meaningful inclusion of affected parties (ASM, communities, and conservation organisations)*. Therefore, while this report suggests next steps and guidance from ASM-ESER models achieved elsewhere, this implementation process must be led by those who will ultimately have regulatory and legal authority over operations and in close consultation with those who will be affected.

The underlying questions which guided the research are:

1. *What is the history of ASM in Gabon, including state interventions, and what is the situation now?*
2. *Under what circumstances can ASM occur in critical ecosystems such that it does not deplete conservation value and can contribute to socio-economic development?*
3. *In recognition of international benchmarks, current laws, and the current local context, how can Gabon achieve ESER-ASM and successfully optimise the development potential of ASM whilst addressing and managing its environmental and social liabilities?*

Methodology

Primary data was obtained through analysis of historic and existing laws, as well as through fieldwork in Longo and Ndangui during two missions and formal and informal interviews with ASM stakeholders in Gabon. It was the original intention of this work to study in detail the ASM of the Minkébé mining camp and its satellite camps. However, in May 2011 the Gabonese army evicted the miners from the camps and closed off the zone. This rendered access to the selected research sites impossible. Consequently, to characterise the ASM occurring in critical ecosystems in Gabon, and upon recommendation of the ANPN, research was undertaken in Longo and Ndangui, which are situated in forestry concessions not far south east of the Ivindo National Park. Still, the report features case studies of all three sites—Ndangui, Longo, and Minkébé—with the information on Minkébé mining zone being derived from data collected over several years by the ANPN, WWF Gabon, and by the Wildlife brigades of the Ministry of Water & Forest. Field research at Longo and Ndangui took place from September 10, 2011 to October 5, 2011. For both missions, permission was sought and granted by the field team from national and local authorities and from local communities. Though the change from Minkébé to the Longo and Ndangui sites did impact the timeframe and budget of the research, fieldwork at these locations was performed nonetheless to ultimately provide the increased width and depth resulting from a multiple case study project.

The findings presented were gathered based on guidance from the draft ASM-PACE Methodological Toolkit, which has been purposefully designed for field-based research on ASM occurring in protected areas and critical ecosystems to provide baseline assessments of ASM sites to support ongoing monitoring and evaluation and the development of appropriate management responses. The toolkit is available via the ASM-PACE programme website, www.asm-pace.org

Background on ASM-PACE

The report is issued as a part of the Artisanal and Small-scale Mining in Protected Areas and Critical Ecosystems (ASM-PACE) project, a joint initiative by the international conservation organization WWF and specialist natural resources and development consultancy Estelle Levin Ltd. The aim of ASM-PACE is to address the environmental impacts of artisanal and small-scale mining (ASM) whilst building on its economic, social, and empowerment potential in some of the world’s most important ecosystems. ASM-PACE work in Gabon is generously funded by the World Bank’s Program on Forests (PROFOR), the Tiffany & Co. Foundation, WWF USA, and with the technical support of WWF Central Africa Regional Programme Office (CARPO).

It is intended that the lessons learned from this Gabon study will feed into the development of sustainable responses to ASM in critical ecosystems both within Gabon and elsewhere, either directly through ASM-PACE activities in conjunction with national or international partners or indirectly through information sharing (tools, guidance notes, and project reports).

Key study findings

State of ASM in PACE in Gabon

This report gauges to what degree ASM in Gabon is ecologically and socio-economically responsive and offers concrete steps to make it more so. Consideration is given to how and where the ASM is practiced, its legality, past efforts to make it more ESER, and other factors that determine the feasibility of incentivising more responsible ASM in Gabon, and in particular in protected areas and critical ecosystems. According to some estimates, there are between 5,000 and 10,000 artisanal and small-scale miners in Gabon¹⁶ who primarily mine gold and, to a lesser extent, diamonds.¹⁷ Table 1 includes more than thirty historic ASM sites. Most are understood to be active.¹⁸

Known ASM sites in Gabon (Historic and contemporary)	
Province	ASM Sites
Estuaire	Kango, Kinguéle, Nkan, Tchimbélé
Haut-Ogooué	Bakounba, Moanda, Mounana, Okondja
Moyen- Ogooué	Between Lambarané and Fougamou, N'djolé
Ngounié	Étéké, Guietsou, Ikobé, Malinga, Mandji, Mbigou, Nzenzélé, Sindara
Nyanga	Between Mayumba and Tchibanga, Maobi, Mouenda
Ogooué-Ivindo	Batouala, the Belinga forest, Mont Boka-Boka, Makokou region, Maybouth, Mimbo-Mimbo, Ngutu, Nyavom, Ntsenkélé, Grand Bois, the Ovan zone along the Mvoun, along the river Oua, Sassamongo
Ogooué-Lolo	Longo, Ndangui, Pana
Wolue-Ntem	Medouneu, Minvoul, Mitzic, Mébaga, Oyem, Minkébé, Minkuka, Masoko, Téka-Téka

Table 1: Known ASM sites in Gabon per province¹⁹

In general, ASM's main impacts in critical ecosystems in Gabon appear to relate mainly to impacts on biodiversity, forest and water. The impact on biodiversity and forest degradation stems from human pressure and from ASM activity. Human pressure results in clearing of lands for agriculture and housing. Additionally, hunting associated with increased human pressure has an impact in biodiversity; the issue of hunting for bushmeat is addressed later in this report.

The impacts of ASM to the field sites of Longo and Ndangui are generally mild as the zone is not overpopulated and ASM practices are not (semi) industrialised. In Longo, difficult access to the zone keeps larger populations at bay. However, an exception to the 'mild' impacts at these two sites is the impacts of ASM on water levels and on watercourses, as indicated by the Ndangui example (as well as Minkébé). Longo thus far shows no profound signs of impact on waterways, yet that is not the result of different methods but is rather due to lower number of active miners and a less lengthy history of mining in that location; the ASM site at Longo only reopened from 2006. ASM's impacts on water can be broken down into four elements: (1) Derailment of watercourses to bring water to the pits, either by the creation of canals or through extraction of water through motor pumps. The latter derails waterways as it changes the water levels and the speed of the current, causing sedimentations and hence river routes to change; (2) Clutter of waterways by debris, and perhaps more importantly, by mud hosed away to find gold; (3) Affecting groundwater levels as pits are kept dry. This affects nearby plants whose roots can no longer extract enough water from the ground; and (4) Change in turbidity levels of the water, affecting water flora and fauna.

¹⁶ Fairtrade, SOFRECO

¹⁷ Hayes and Wagner, 2008

¹⁸ Lahm; Zoological Society of London; WWF

¹⁹ Lahm; Zoological Society of London; WWF

While all of Gabon is considered by WWF and others to be part of critical ecoregions²⁰, ASM has so far been confirmed as occurring within only three protected areas: Minkébé NP, Moukoulaba Doudou NP, and Monts de Cristal NP. The mining camps at Minkébé are largely in the buffer zone of the Minkébé National Park. The camps in Minkébé and its buffer zone²¹, and those in Moukoulaba Doudou areas are inactive as of the time of this report, due to (1) the 2011 eviction of artisanal miners in and around Minkébé and (2) Moukoulaba Doudou's park director's decision to decline a request from gold miners to reopen the Mendo site.²² Therefore, Monts de Cristal is presently the only known active ASM site inside a national park in Gabon and, at that site the impact is deemed manageable,²³ due to the low number of miners present.

Legal notes on ASM in Gabon

- Legal artisanal miners are not bound by environmental or health regulations. The only mentioning of health in decree 1085 is in article 216 where it states that the Ministry of Mines needs to inform relevant local authorities of concentrations of human beings in artisanal mining camps; this to prevent epidemics, e.g. of Cholera, AIDS or Ebola.
- For those miners wishing to organise, the legal option of a cooperative is available to them (per article 122 of the Mining Code. Directive No. 1080/MMEPRH/SG/DGMG/DMC of 29 October 2007). However, taxes and regulations (e.g. registration with the chamber of commerce, health and safety regulations etc.) are noticeably absent from current legislation (Decree 1080). Not only is this remarkable, it is in contrast with other existing and comparable Gabonese legislation, e.g. the Agricultural Code which stipulates that agricultural cooperatives are exempt from certain taxes.²⁴ Equally salient is the absence of references to other legislation with regards to cooperatives, nor does it refer to the Ministry of Small and Medium Enterprises, Artisans, and Commerce (*Ministère des Petites et Moyennes Entreprises, de l'Artisanat et du Commerce*). In all, artisanal mining cooperatives seem to be in a legislation void.
- Neither the code nor the decree mentions any environmental obligation with respect to the practice of artisanal mining.
- Current definitions of artisanal mining and small-scale mining are imprecise. The definition of small-scale mining is significantly more precise than that of artisanal mining, yet there remains an apparent legal grey zone for mining that is staffing less than seventy people. The legal grey zone exists *because* artisanal mining is defined less precisely. Underscoring the importance of definitions, the law allows the government to close down an artisanal mining zone when it considers the means of exploitation no longer in line with what is deemed artisanal (article 129, decree 1085). From the closure notice, artisanal miners then have two months to organise themselves as a small-scale mining operation and apply in accordance with relevant regulations (Article 130, Decree). The miners can only weakly contest the opening or closure of a zone to artisanal mining.
- By law, the Ministry of Mines can support small-scale operators to improve existing technologies or to introduce new techniques with regards to artisanal mining. This can either be free services or this can be against payment, e.g. for the supply of materials necessary for their activity (article 105, Mining Code).
- Technically the government requires artisanal miners to sell mined gold at fixed prices that may be uncompetitive with the black market rates available.

In sum, given the legal definitions and slim benefits of formalisation to artisanal miners in practice, the following situation exists: a small-scale mine is a business entity whereas artisanal mining in Gabon, even if all regulation is fully implemented, is one step above informal employment. Indeed, artisanal miners gain little with the purchase of a *Carte d'Expert*. If anything it puts them on the radar of the government when they are already in a weak negotiating position, even if they are legal. Ultimately, artisanal miners are at the bottom of the mining hierarchy when compared to small-scale mines and large-scale mining (LSM) as permits for the latter two outrank artisanal mining rights, *Carte d'Expert* or no *Carte d'Expert* (Small Mining prerogative article 146, decree 1085, LSM prerogative articles 131/132, and decree 1085). The only mention of compensation is with regards to small-scale mining's prerogative over artisanal miners as article 146 of decree 1085 stipulates that, where the coming into existence of a small-scale mine necessitates an end of artisanal activities, a small-scale mining entity must prioritise the hiring of those artisanal miners who hold a valid *Carte d'Expert*. No comparable obligation is mentioned for LSM entities when finding artisanal miners on their site whose activities need ceasing.

²⁰ Gabon's forests are relatively intact and with important biodiversity including large mammal populations throughout the country

²¹ By law, while ASM explicitly is allowed in a national park's buffer zone, this right is conditional upon the production of EIA, to be approved/validated by national authorities.

²² Personal communication by Hollestelle with Sebastiaan Verhage, WWF programme manager Gamba complex, which includes Moukala Doudou.

²³ Personal communications communication between Hollestelle and WWF Gabon.

²⁴ Loi n° 022/2008 Portant Code Agricole en République Gabonaise.

ASM Field Case Studies

Case study: Ndangui

Ndangui is an ASM zone, based in the canton (county) Lassio-Sébé, in the department of Mouloundou (Lastourville). Ndangui is a *regroupement* comprised of three villages under one administration. Together, the three villages-- La Chute, Venez-Voir and Popa-- house some 600 people. The Ndangui ASM zone has been operational since 1962, is situated approximately 40 kilometres from Ivindo National Park, and is located within the forestry concession of Cora Wood Gabon. This concession has "CFAD" status (*Concession Forestière sous Aménagement Durable*), a sustainable forestry certificate required by the Gabonese government which stipulates sustainable timber extraction as well as safeguarding of the flora and fauna by preserving the existing ecosystems. Thus seen, these areas can be regarded as protected forests in their own right, with the distinctive difference that there are villages in these concessions which hold legal subsistence user rights over their natural surroundings. The zone allowed to use for subsistence purposes is limited to a 5km radius from the village. Despite the user rights being legally embedded, definitions of 'subsistence use' of specific natural resources is becoming a bone of contention between conservation NGO's, state authorities and the villagers. Increased human pressure in the region results in increased subsistence activities which can range beyond the natural carrying capacity of the surrounding forests. Given the severe impact and commercial nature of artisanal mining, doubts have arisen as to whether artisanal mining should be covered by the definition of subsistence use.²⁵ The miners of Ndangui argue that it does as the larger and many of the smaller pits are located within the zone to which the Ndangui villagers by forestry law have customary user rights.

Mining activities in Ndangui

In Ndangui mining is done by the men. During the school holidays, children and women assist, e.g. by sifting the sand. In those holiday seasons people work in family units. In Ndangui, production appears to be between 1 to 5 grams a day per miner. At the time of research in Lastourville in September 2011, one gram of gold from Ndangui traded at 19000 XAF, or 29 Euro, which is roughly 75 % of or 10 Euro less than the international market price.²⁶ In Ndangui a serious injury in the village, e.g. bodily harm due to the pick-axe or the shovel, was said to occur no more than once every three months. ASM related fatal accidents, mostly due to the collapse of a pit wall, were said to transpire on average once every six months. Malaria is prevalent. Relationships are generally good between local actors and others, including with the gold buyers. Yet tension exists between local actors and some external actors, namely: government actors (for the lack of support on mining, for the lacking medical supplies in the dispensary, etc.), and transporters (due to the very high costs of transport.)

Land use within the larger surroundings of Ndangui is dominated by forestry operations. There is also active interest by international mining firms. Ndangui is within the area covered by the research permit #G7-317of Ivanhoe Gabon, a subsidiary of the Canada based IvanPlats, which is exploring for gold. Importantly, as confirmed by the Ivanhoe geologist, the deposits eyed by Ivanhoe are not, entirely, the same as the alluvial deposits currently mined by the artisanal miners in Ndangui butt rather deeper and also some non-alluvial deposits in the archean greenstone belts.

Agricultural use of the land seems to be on the rise in and around Ndangui. The most cited reasons for this are additional income and the prohibitive pricing of vegetables brought into Ndangui through the transporters.

Several attempts have been made over the past years to organise the artisanal mining sector, of which two stand out. First is the so-called '*période Gilbert*' in which, under tutelage of the Ministry of Mines, an organisation headed by Mr Gilbert bought the gold from the miners while also furnishing mining camps with food, sundries and tools. To do so, the Mr Gilbert outfit made use of Tigre helicopters. The Ndangui miners mentioned they were very appreciative of that arrangement. The EU's SYSMIN is a more recent intervention through which the MoM and foreign consultants introduced motor-pumps and new mining techniques to the artisanal miners through one-off training sessions. In Ndangui, only the motor pumps have remained; none of the new techniques were found to be in use. Miners also felt pressured to organise themselves into cooperatives. They claim that cooperatives, as they were presented to them, are against their decades-old ways of organizing as independent workers. There is apparently some confusion as to how cooperatives work; miners of Ndangui are under the impression that they would be made to organise in groups with

²⁵ Mining on a subsistence basis means individual miners are mining to feed themselves; they are not mining to run a profit. Subsistence in this context means that profit is not the motivation; survival is. (This is consistent with the interpretation by the Association for Responsible Mining, see Barreto 2011) So an activity that while ultimate product is cash (or is itself used for cash to access goods / services) it serves to aid people to live hand-to-mouth and deal with their most pressing issues. Ultimately, whether an activity is subsistence or not is determined by the motivations of the miners, the level of organization, and profits generated. Conservationists tend to be wary of allowing artisanal mining to be defined as an allowable subsistence activity given its potentially high impacts if the numbers of people allowed to do it is not controlled and the activity actively managed.

²⁶ <http://www.goldprice.org/spot-gold.html>

one owner and 10 employees or more, which is indeed against the individual approach that is currently the *modus operandi*. Though it cannot be excluded that miners misunderstood the explanations, these are the facts as the miners perceive them. There is also some controversy with regards to the *cartes d'expert* (the mining licence given to individual artisanal miners)²⁷, as it is rumoured amongst the miners that false cards are in circulation. Added to that, all those interviewed and in possession of a *carte* said local authorities had little to no knowledge of what the *carte* stood for in terms of rights held by the bearer of the *carte*. In Ndangui people have grown distrustful of government officials and politicians in the zone.

Ndangui is legally recognised as a village and villagers have rights to use the forest and to mine. With the constant traffic of transporters and the well-stocked shops, the bars and restaurants and agriculture and livestock, in many ways it is better equipped than are many other villages in Gabon. As most of the houses were solid wooden constructions with corrugated iron roofs, housing was well taken care of as well. Crime was said to be very low. People rent out rooms and houses to new arrivals that are looking for gold. It transpired that savings from mining income are built brick by brick in the form of houses both in Ndangui and outside. If not in Ndangui, houses are built for family, such as parents and spouses with children, living in Lastourville, Koulamatou, or villages of origin in cases where people were not from Ndangui. Once parents and spouse have a roof, a new house is built to rent out. Banks, a social savings plan (as exists in Gabon), and other institutional saving schemes were not used. The basic reason for this informal saving plan is that people cannot secure bank product or open an account with the National Register for Social Services because 'artisanal miner' is not recognised as a profession. What is more, even miners in possession of a valid *carte d'expert* cannot list "artisanal miner" as a profession on their identity papers and, hence, they invent other professions.

Case Study: Longo

As opposed to Ndangui, Longo is not an established village but instead a mining zone consisting of several mining camps located at more or less 20 km from Ivindo National Park. The camps in the Longo zone, as far as located by the research, are: Mitounga; Ville Mehanwou, Ville Niabe; Abondjé; Otounga; Ville Meyong; Ville Saleyong; Bossokobenga; Afrique du Sud; Songa; Longo was a busy mining site from the 1960s until 1992. The zone was left all but deserted due to the diminishing gold recovery and, more importantly, because of the withdrawal of the services of Mr Gilbert's outfit in 1989. This rendered life in the camps quite hard. In 1992, when gold was rumoured to be plentiful in the Minkébé artisanal mining zones, only a few people remained in Longo. The only sites that were found active during the time of the research were Mitounga, Ville Mehanwou, Ville Saleyon and Ville Niabé.

Similar to Ndangui, the Longo site is situated within a forestry concession (SEEF) as well as a larger-scale industrial mining prospecting concession. Goldstone Research Limited Gabon holds a prospecting license to find gold, copper, lead and zinc (#G2-320).

ASM activities in Longo

Similar to Ndangui, ASM is conducted in a distinctively artisanal fashion. However, unlike Ndangui's lunar-like landscapes, Longo miners work their pits mostly under the canopies of the rainforest. As in Ndangui, mining in Longo is done by the men. During the school holidays, children and women assist usually by sifting the gold-bearing sand. In those holiday seasons people work in family units. If people are asked for support, they are paid with food and drinks. If people work in a team throughout the process, the findings are shared equally. Such teams tend to consist of three men. The few women in the area typically perform the classic chores of the home such as tending after small children, doing laundry, cooking, etc. Most women are also engaged in trading, one was found to have recently commenced an agricultural plot. Seasonal or non-seasonal, official numbers cannot be obtained as Longo is not an official administrative unit and is hence not included in any official census. As Longo is little-developed, not many income generation activities exist next to ASM. Many of the miners and their families bring some or more supplies into the camp. Only three sell to others. The biggest retailers are a single woman and the Matounga camp chief and his wife.

Illegal hunting in Longo

Though several anti-poaching missions found hunting activity in and around Longo, the findings do not suggest commercial bush meat hunting.²⁸ This may be explained by the fact that little cooling capacity is available in the camp while transport to Lastourville is limited and controlled. That stated, a November 2010 anti-poaching mission found not only the carcass of an elephant, but the meat and the ivory as well. The same mission found the skin of a leopard in one of the huts. These animals are fully protected under Gabonese law which states that the hunting, trade and even the transportation of these species is prohibited year-round. Both instances were in Matounga camp. A later mission,

²⁷ As the research team assured the miners anonymity unless explicitly asked permission, reference to the identity of the card holders has been erased.

²⁸ LAB / WCS reports

late May/early June 2011, anew found ivory.²⁹ A recent mission in November 2011 no longer found traces of elephant poaching in Longo, however, snare wire traps were found outside the hunting season. It is unclear to what extent the artisanal miners are involved in the hunting, particularly given the presences of a large forestry camp near to Longo.



Figure 1: ASM activities in Longo.

Photo credit: M.R. Hollestelle; 2011.

Case Study: Minkébé National Park

Minkébé National Park 7,567 km² is located within the larger Minkébé Forest that covers 32,381 km², in the north-east of Gabon. Minkébé National Park was established as a provisional reserve in 2000 and officially recognized and established as a national park by the Gabonese government in August 2002. It is recognized as a critical site for conservation by the IUCN. The Minkébé forests are inhabited predominately by Fang and Baka people, though the Minkébé National Park has no permanent human population. 'Minkébé' refers to the national park by that name as well as to a large the artisanal mining settlement just outside of the park perimeters. In the Minkébé forest, artisanal gold mining was started before Gabonese independence by a French forester named Ferdinand Roux,³⁰ who started the Ambe camp located 40km northeast of Makokou and which still exists. Roux and his Gabonese counterpart Samuel Issezi ultimately established more camps thereafter. The current Minkébé camp has been an active gold mining camp since 1991.³¹ The buffer zone of the Park is largely dominated by artisanal mining. Hunting³², fishing, and mining camps on the borders of the park are pictured in Map 2 in Annex A. Management of Minkébé National Park is under the auspices of the ANPN³³, through the presence of two park wardens (*Conservateurs*), based in Oyem and Makokou and assisted by four eco-guards each.³⁴

²⁹ LAB Compte rendu, June 2011

³⁰ Lahm 2002

³¹ Lahm 2002

³² Hunting in the buffer zone of the Minkébé National Park is legally forbidden.

³³ Additionally, the park staff works in cooperation with the Ministry of Water & Forest and that of Defence (Gendarmerie Nationale and recently militarily-retrained as eco-police) and it receives financial support from the government of Gabon and additional financial, logistical and human support of WWF-Gabon.



Figure 2: Small-scale gold mining pit in Minkébé.

Photo credit: Koumbi, 2009

Mining in Minkébé

Except for the depth of the pits through terracing and for the organisation of labour in the big pits, the Minkébé site is similar to other mining sites in Gabon in terms of techniques used, which include motor pumps, hoses, tubes, piping, basic sluices with riffles, pans, shovels and crowbars. Perhaps surprisingly, investment in capital had not replaced any labour. This indicates wages are low enough for owners not to be interested in making the process more capital intensive by even slightly investing in more optimal techniques, e.g. mats. ASM methods prior to the most recent eviction of the area in June 2011 bordered on ‘small-scale mining’ owing to the level of organisation and technology the miners were deploying. Indeed, different from the more rudimentary artisanal pits, the larger pits are mined in a more specialised quasi-industrial fashion using two and some even three 8 hour shifts of employed labourers per day.³⁵ When operational, the Minkébé mining site’s landscape was marked by deep excavations and smaller individual pits in the satellite camps; now these pits have been reclaimed by the abundant water which marks the adjacent surroundings.

Previous intervention attempts

Several stakeholders have, through the years, intervened in the ASM operations occurring in Minkébé National Park and its buffer zone. These include the Ministry of Mines, local authorities, WWF, ANPN, the Ministry of Water & Forest, and, most recently, the Ministry of Defence.

WWF Gabon has been engaging with the Minkébé mining populations since 1998. Together with the conservation authorities, WWF Gabon has undertaken several sensitisation, research, biomonitoring and investigation missions to the region leading to several agreements on wildlife management between the camps, WWF, the Ministry of Water and Forestry and local authorities.³⁶ These agreements have typically included a ban on hunting of all protected species, as well as prohibition of the bushmeat trade from the camps to Makokou. Agreements have been attempted with national-level government ministries – including The Ministry of Forest Economy, Water, Fisheries and Aquaculture; The Ministry of Mines, Energy, Petroleum and Hydraulic Resources; The Ministry of Tourism and

³⁵ SOFRECO, Mabaza 2011, personal communication with WWF-Gabon staff.

³⁶ Personal communication between Hollestelle and WWF-Gabon.

National Parks; The Ministry of Interior, Security and Immigration—and local authorities, and representatives of the gold sites themselves, such as from the Minkébé, Menkuka, Ngutu sites.

The latest draft version (dated from 28 March, 2008) of a seven page Memorandum of Understanding (MoU) between all parties involved aimed to regulate hunting, mining, trade, and transport of gold, and, also to formally prohibit the use of mercury, cyanide and other chemicals in the area.³⁷ The miners present in the area needed to be in possession of valid '*Cartes d'Expert*', issued by the Ministry of Mines which was also to collect statistics on gold production and promote better mining methods.³⁸ Patrols of conservation authorities, supported by the local administration and security and defence forces were to guarantee the enforcement of the agreement, even before its signature. The MoU has never been signed. One of the reasons was the influx of miners the camps in the Minkébé zone suffered from 2008 onwards.³⁹ It was felt that the 4,000 people in the region, most of them newcomers with whom the conservationists did not have existing relationships, rendered the regulations and activities anticipated by the draft MoU impossible to enforce. What is more, the subsistence use of the natural surroundings by the 4,000 plus people in the region was considered to be beyond the carrying capacity of the zone in terms of environmental impact.⁴⁰

The 2011 eviction of the Minkébé camps

Local discontentment with the view that foreigners were financially benefitting from uncontrolled illegal ASM, concern by the State as to the illegality and lack of revenues from the gold sector in Minkébé, and concerns that poaching for bushmeat, ivory, and other illegal activities were increasing at an alarming rate, led to the government evicting all miners from Minkébé on June 1, 2011. The purge led to between 2000 and 5000 mainly Cameroonian illegal immigrants leaving the Minkébé ASM zone. The military have remained in the area, also evicting illegal fishing and hunting camps. Camps are still occupied by the military to prevent the miners from returning.

There is now significant government and local interest to re-open the Minkébé camps to local Gabonese miners. The forced exit of illegal Cameroonian miners has apparently been welcomed by locals. Though outnumbered in recent years, the Minkébé zone was historically populated with Gabonese miners, pit owners and traders, though most Gabonese traders were ambulant.⁴¹ Gabonese miners who engaged with the different conservation initiatives have often been keen for the government to step in, a sentiment likely to have been shared by other miners.⁴² As a matter of fact, throughout the last decade reports on Minkébé and other mining camps, e.g. along the Mvounou River, consistently show a desire of Gabonese miners for their trade to be formalised and for the government to address the influx of foreigners. Combined with the government's desire to control the gold trade and coupled with the Park Authorities' desire to safeguard the conservation purposes, the notion of ESER-ASM gold seems appealing to all parties as a viable solution. The time may be ripe to begin work towards a win-win, shared vision.

ASM and poaching in Minkébé

The phenomenon of elephant poaching, thought to be closely associated with ASM activities in the park, formed an important part of the Government's eviction rationale.⁴³ Yet as recently as May 2012, ANPN officials who surveyed hunting activities in the larger Minkébé zone stated that, although bushmeat hunting may now be gone in and around the Minkébé camp, the elephant poachers have not at all left the area. Worse, elephant poaching is still on the rise,⁴⁴ despite the state paying 30 million XAF per month for the securitisation of the Minkébé zone following the eviction.⁴⁵ The fact of increased elephant poaching could be due to a number of reasons. It could signal that the miners were not actually involved in the poaching (as the miners were evicted from the area in June 2011⁴⁶) and it may in fact be the work of an independent network of commercial poachers with powerful links.⁴⁷ Reportedly the criminal networks are

³⁷ No mercury or cyanide is used in these gold camps in Gabon and none was found during the course of the field research.

³⁸ The MoU does not state the reason for introducing these new techniques, for example, to improve yield or lessen environmental impact.

³⁹ Several oral and written reports indicated a rise in Minkébé's population from roughly 650 to 5000 in less than 3 years. Source: Koumbi 2010, Kengue, oral reports from Richard Rugiero from US Fish & Wildlife who had just come back from the camp together with Mike Fay, technical director of the Gabon National Parks Authority.

⁴⁰ ANPN and WWF staff.

⁴¹ Lahm 2002.

⁴² For example, see Mbaza, 2004.

⁴³ Personal communication between Hollestelle and WWF and WCS staff.

⁴⁴ Personal communication between Hollestelle and ANPN staff.

⁴⁵ Société Equatoriale des Mines (Gabon Mining).

⁴⁶ However, it is also possible that the increased elephant poaching could also be due to evicted miners who are now working exclusively in the ivory trade, rather than working informally in both sectors. Miners were not tracked after the eviction process nor are they being monitored, therefore the exact reasons behind the increase can not be said definitively, but at the very least it does find reason to question previous assumptions of a direct link between ASM and ivory poaching.

⁴⁷ Personal communication between Hollestelle and Conservation Justice Gabon

establishing small base camps throughout the forests to keep increasing their trade.⁴⁸ Without successful efforts to eradicate these networks, illegality will continue; the importance of this notion cannot be overstressed given financial and security consequences for the state.

Recommendations and Possible Next Steps

Chapter 8 of this report contains an extensive list of recommendations and suggested next steps. Given the fact that Gabon is in the process of finalising the development of a new Mining Code to govern the industry in Gabon, it is important to ensure that this new legal framework facilitates ESER-ASM. A comprehensive policy framework to address artisanal mining at a national level is essential to make the recommendations presented in this report truly effective.

The following are a selection of recommendations from the longer list contained in Chapter 8:

Update requisite policy & legislation to:

- ***Address the specific rights and duties of artisanal miners (as opposed to small-scale mining operations), including long-term security of tenure and institute realistic, environmental and safety requirements.***

While bearing in mind the capacities of artisanal and small-scale miners to adhere to complex environmental regulations, the law can be strengthened to incorporate realistic and manageable environmental demands on ASM. This should be paired with an approach towards ASM in the new mining code that emphasises its rationalisation and professionalization, but working from existing structures. The aim should be to strengthen the miners' duties as well as their rights. Limiting of *cartes d'expart* to defined concessions could help to rationalise artisanal mining, to give it a literally rightful place next to SSM and LSM, and to entice miners to invest in their undertaking.

If one wants miners to invest in their work, there should be an appealing long term security of rights. However, at present miners can be evacuated from their pits without compensation and without clear motivation or clarity on their legal rights. Miners should be entitled to challenge evacuation of 'the closing of their 'zone' as the law puts it.

Possible approach:

1. *Initiate a participative and inclusive debate on development opportunities created by responsible ASM, focusing on ASM as an economic activity that is part of the extractive industries sector and not as a "social phenomenon".*
2. *Work towards a consensus of key stakeholder groups (Government agencies, civil society, ASM miners, industrial miners, etc.) on ESER-ASM and required framework conditions to enable ESER-ASM.*
3. *"Translate" the consensus into a legal concept*
4. *Link the process of promoting an enabling legal framework for ESER-ASM with an empowerment process of facilitating the creation or the strengthening of a national ASM organization, empowering a group of ASM leaders to lobby for "their law".*
5. *Avoid direct external involvement; always keep in mind that "Gabonese laws are made by Gabonese people".*

To improve implementation of existing laws:

- ***Strengthen the field presence, capacity, and knowledge of the Ministry of Mines to work on and monitor ASM***

Currently two field stations of the Ministry of Mines are operational: Franceville and Makokou. The latter is well located to work on ASM as the wider region is subject to increasing ASM activities. Yet, the Artisanal Mining areas north of Lastourville, the Etéké site, the Ndjolé site to name but a few, are far from any field office.

Appointing even only one well trained, and well equipped person per region would have a large impact in terms of information flow, distribution and monitoring of *cartes d'expart*, the location of miners, facilitating technology transfer etc. This can help improve relations between the miners and the Ministry of Mines, particularly if respect for the miners, professionalism and enthusiasm for the subject are key competencies of the incumbent.

⁴⁸ Personal communication between Hollestelle and ANPN and WWF staff

To manage ASM in Protected Areas and Critical Ecosystems:

- **Develop partnerships with natural resource extractive companies.**

Natural resource extractives companies, e.g. mining and logging companies, have a great potential role in safeguarding Gabon's unique ecosystems. Further, there is an increasing overlap between traditional ASM locations and the concessions of larger-scale commercial mining and forestry companies, which will lead to the displacement of ASM most likely to existing or new ASM sites in other sensitive ecosystems so spreading the environmental impact.

Authorities and companies could address the impacts of displacement and also improve community relations via partnerships that would allow artisanal miners to work in parts of the logging or mining concession, with suitable terms that would be mutually agreed between the company and artisanal mining communities (and government, where applicable). Such agreements should even become a pre-requisite for exploration companies, who often determine their exploration targets using "occurrences of ASM" which then obviously ends up being to the artisanal miners' disadvantage should a project move to mine development. Cooperation between industrial and artisanal mining entities should be part of the companies' community engagement strategy. Besides helping companies obtain their "social license to operate," such cooperation could also help mitigate their impacts through the introduction of environmentally-friendlier and higher-yield processing techniques taught by the company or a third party provider. The Responsible Jewellery Council's Code of Practices and Chain of Custody Standards has provisions that are designed to incentivise gold, platinum group metals' and diamond mining companies to do just these things, in the interests of best practice and assuring 'responsible mining'.⁴⁹

Possible approach:

1. *Assess and potentially revise mining legislation to address any legal implications of partnership agreements between industrial mining and artisanal miners working in their concession areas. Any legal risks or liabilities for the concession owner? Any incentives?*
2. *Conduct a workshop with industrial mining entities (Probably through UMIGA) and the Government to explore how this might best work, consulting the ICMM publication "working together" and similar guidelines and perhaps involving organisations, companies and governments who have considered or attempted these types of arrangements in other countries (e.g. Goldfields, Ghana; various in DRC; Eurocantera, Honduras ; Responsible Jewellery Council member mining company working in Peru ; Solidaridad, etc.). The fact that most mining operations in Gabon are still in the exploration phase offers opportunities to conceive 'partnerships' from the very early start of mining projects.*

- **Adopt Mining-Mindful Land Use Planning across government ministries.**

When Minkébé's status changed from a reserve to a national park, the borders of Minkébé changed too, thus replacing the former 'finger' shape by the current 'finger' shape to accommodate for possible future industrial mining of iron ore as well as the main ASM sites.

We underscore the importance of taking artisanal mining activities into account in present future land use planning processes to prevent similar conflicts where possible. The report notes that current law allows the borders of national parks to be changed (see section 3.5.3). Such a drastic action would not be generally recommended, but may be the best option in certain circumstances.

Possible approach:

1. *Undertake a national scoping and resulting mapping of artisanal mining in PACE in Gabon, to feed into the national land Use Planning Process.*
2. *Integrate geologic data in land use planning processes.*
3. *Create awareness among governmental agencies involved in land use planning processes that all greenstone belts and banded iron formations have the potential of gold mineralizations and are therefore potential (and probably existing) AMZs (as well as zones of potential interest for industrial mining).*

- **Use evictions only as a last resort, but if you are going to evict, resource, plan and do it well.**

While evictions are the most used strategy worldwide to address ASM in PACE locations, they are very prone to failure. It is therefore important to emphasise the real risks evictions bring:

Evictions often fail because eviction planners often do not understand the context, such as the hidden but significant

⁴⁹ For additional information on RJC standards, see: <http://www.responsiblejewellery.com>.

role ASM may play in local and regional economies and the reasons why ASM is such an attractive livelihood to people owing to the multiple functions it serves for vulnerable rural individuals and households.⁵⁰

Evictions can also fail because planners do not understand or appreciate how evictions risk exacerbating conflict, arms proliferation and human rights abuses.

Evictions have the high potential to disrupt local economies that have developed based on ASM and also alienate communities who have gained livelihoods through the trade. Hence, evictions are not recommended but as a last resort in cases of critical risks to local or even national security.

In order for an eviction to succeed in the long-term:

There needs to be a sustained security presence. Depending on the structure, this can be a costly endeavour and also risks the corruption and clandestine entrenchment of the security forces if they become involved in illegal mining. The permanent establishment of an effective law enforcement regime in ASM zones, either through frequent patrolling and / or to the creation of outposts of law enforcement agencies, could be a more effective and less risky alternative to evictions. If established in the early stages of ASM site development, the need for evictions may be avoided altogether.

There must be an exit plan developed prior to the eviction, i.e. what needs to be done to structurally expel mining even without security forces present. Such a plan should include: (1) the long-term security plan; (2) facilities for reimbursements; (3) a compensation framework; (4) resettlement measures (thoughtfully, sufficiently and sustainably replace the economic activity they would be disrupting for the same period of time); and (5) a grievance mechanism. Each of these components should be designed and implemented with the oversight of an independent credible international third party monitor to guard against the potential for or claims of human rights abuses.

Possible approach:

1. *Exhaust all options*
2. *Be realistic in long-term planning requirements vis-à-vis state capacity, rural development goals, economic potential, and long-term feasibility of alternative programmes that would provide the same-level of income and benefits for Gabonese miners in the area. A gender lens with all programmes is critical to economic and social development and preventing gender-related human rights abuses.*
3. *Guarantee long-term financing for such programmes, including for post-eviction activities.*
4. *Create contingency plan for the potential that the eviction may fail.*

- ***Consider short and long-term policy measures that can enable a Sustainable Supply Chains (SSC) approach.***

Sustainable supply chains are market-based development initiatives aiming for improved social, environmental and economic performance of producers and driven by end-consumers' demand for products with such ethical qualities. SSCs have increasingly become one of the cornerstones of multi-pronged strategies in other contexts around the world to effectively professionalize, manage, regulate and increase benefits from ASM and work towards ESER-ASM. It involves the organisation and formalisation of ASM and the downstream trading chain, the introduction of environmentally responsible and socially beneficial production methods, financial benefit sharing, and enhancement of the sector's economic contributions.

Two types of SSC can be broadly distinguished: (i) SSC schemes based on business-to-business (B2B) relations between producers and buyers and relying on first- or second party assurance of compliance, and (ii) SSC schemes based on international voluntary standards, involving potentially large numbers of producers and buyers and relying on independent third party certification. B2B based SSC schemes are "relatively" easy to establish, once an interested partner⁵¹ at the demand side is identified. They mainly depend on a convincing (and obviously facts based) "story" of the gold which can be told to the end-consumer.

Standards based SSC schemes use elevated levels of compliance criteria which, currently, would be a major entry barrier for almost all Gabonese miners.⁵² With increasing progress towards ESER-ASM the gap between requirements

⁵⁰ People often undertake ASM because it offers opportunity to earn higher income for unskilled or illiterate individuals.

⁵¹ This report does not mention names of potential B2B partners, in order avoid promoting particular companies. Potential companies, mainly small jewellers, are abundant and easy to identify: a Google search for the term „fair gold“ in June 2012 rendered 97,000 results.

⁵² For example, a particular aspect with regards to the FT/FM Standard and the aspirations of the ASM-PACE project to resolve ASM issues in Protected Areas and Critical Ecosystems is that ASM operations in such critical areas are excluded from certification as FT/FM, unless they can demonstrate a positive environmental track record and have an appropriate environmental management plan approved. It is considered unlikely that other eventual future SSC Standards for ASM will set a lower entry bar in protected areas.

and reality on the ground however decreases. The first step is creating the right policy environment and institutional supports to help the sector eventually reach these goals. Therefore, while it is too early in the development of the ASM sector for it to immediately pursue a SSC approach, the approach is worth noting here for the purposes of being ‘destination’ achievements to which to aspire.

As all SSC schemes involve commercial relations, miners must be the rightful owners of the product (gold) and must have the right to trade it. All known SSC initiatives interact directly with producers. The SSC approach can work well with the second strategy recommended here, where industrial mining companies may allow ASM on its concession and buy the gold from the miners perhaps as part of a Fairtrade/Fairmined or Responsible Jewellery Council certified scheme.

Further information on the SSC approach is given in Chapter 7.

Possible approach:

1. *Take legislative steps to create the right policy environment and institutional supports to help the sector reach these goals⁵³, including a formalisation regime that provides incentives for artisanal and small-scale miners to formalise. See additional legislative recommendations in ‘ESER-ASM’ recommendations below.*
2. *Identify potential ASM sites where a SSC approach could be piloted in the next 2 years and produce a facts-based strong and convincing narrative about these sites, in particular how ASM contributes and how ESER-ASM could contribute even more to development.*
3. *Start from an easier to implement B2B based SSC approach and publish the “story” in media reaching the target group of ethical jewellers. Engage with SSC-committed interested buyers.*
4. *Provide producer support to the ASM site enabling miners to meet the expectations of the B2B SSC buyer.*
5. *Always keep the long-term goal of ESER-ASM participating in Standards based SSC schemes in mind.*

Additional measures to manage ASM and its impacts within critical ecosystems:

- ***Identify a ‘model mine’ site and use it to develop models for ESER-ASM around PACE in Gabon, giving the miners a role in environmental stewardship. The model mine could become part of a sustainable supply chain initiative too.***

Such a model could be linked with an organizational “upgrading” of artisanal mining towards formal small-scale mining subject to more stringent environmental requirements. Such models would be particularly attractive in cases where the exclusion of ASM is not practically feasible and where eviction by massive long-term presence of security forces would create an even worse environmental impact and/or be unaffordable.

The existing mining techniques would need to be assessed, as would their impacts and those owing to the miners’ subsistence needs. Mitigation measures would need to be designed to ensure the mining would be less environmentally damaging and more productive, as well as mercury-free. Inspiration can be sought from examples and experiences from Latin America and West Africa, where a lot has been done with simple techniques to make ASM more productive and environmentally responsive.

Successful model mines require:

- Permanent presence of a supervising entity (governmental or government appointed agency)
- Establishment of a supply chain for consumables to eliminate the need for undesired agricultural or bushmeat-hunting side-activities
- Development of an environmental management plan with simple, easy to understand technical, environmental and social rules of conduct for miners
- Incentives for active engagement of miners in protecting the zone (e.g. exclusivity agreements under the condition that miners protect “their” area from newcomers and comply with rules of conduct)

In the short term, such a model mine site (which through organizational “SSM-like upgrading” would be formal and

⁵³ It requires the establishing of conducive policies, laws and regulations, and also the political will and institutional commitment to implement them; Strong inter- and intra-sectoral coordination, including between central and local authorities in the different relevant sectors (e.g. mining, environment, social welfare); Genuine, gender-responsive engagement and empowerment of local communities, inclusive of public sector, civil society, miners and their families; Strategies to professionalize ASM and increase benefits from formalization, inclusive of efforts to build requisite capacity, establish suitable financing mechanisms, strengthen ASM organizations and introduce environmentally-responsible appropriate, intermediate technologies and methods; Support for harmonious co-existences between ASM and large-scale and exploration companies.

therefore able to trade), might become a suitable candidate to be promoted for piloting B2B based SSC initiatives. A site where miners engage actively in protecting the environment would make up a good “story” to market. In the long term, and being able to prove a maintained positive track record under the supervision of the environmental authority, such models could even engage with SSC initiatives which aim to do third-party certification against social, environmental, and commercial criteria.

- ***Develop partnerships with natural resource companies to co-manage the environmental liabilities of ASM***

Partner with forestry companies to manage artisanal mining in forestry concessions.

As forestry concessions border national parks, as forestry concessions are tasked with protection of ecosystems, and as much of AM is taking place in forestry concessions, partnering with forestry companies seems imperative. Given their knowledge of the field, the local ecosystems, and given their on the ground capacity and infrastructure (e.g. roads, transport and camps), forestry companies seem uniquely placed to add to facilitate and, to an extent, enforce ESER standards on artisanal mining

Develop partnerships with Mining companies operating close to protected areas (the Belinga Concession adjacent to Minkébé NP is a good example in case)

To ensure they do not chase artisanal miners into National Parks. When an area is closed off for artisanal mining due to the commencement of large scale extraction, LSM companies can be compelled to hire artisanal miners; much like the current Gabonese mining regulation stipulates for SSM. This means artisanal and small-scale miners will need to be in possession of valid Carte d’Expert to prove their status of Artisanal Miner.

In specific cases, when there is no competition for the extracted minerals (which is generally the case in Gabon, as the LSM are not interested in the alluvial gold), the potential for LSM to host an ASM ‘model camp’ on site can be investigated.

Recommendations for further research

While the research below is recommended to strengthen the understanding of ASM in Gabon and strengthen measures to make the sector more ESER, these recommendations are not meant to postpone action. It is suggested that these studies take place simultaneously, and are an integrated part of the selection of potential pilot sites for a ‘model mine’; and that the selected sites are used to study various aspects of the techniques and impacts of ASM in more detail. However, some of the above recommendations do require further research to ensure understanding is at a suitable level to ensure appropriate and effective action.

National Scoping Study to begin in September 2012

With Support from the US Fish and Wildlife Services, in partnership with ANPN, and in collaboration with ELL, WWF-Gabon, is planning to carry out a rapid nation-wide scoping of ASGM in Gabon, starting in September 2012. This will be done in close coordination with relevant government agencies in order to support them, conservation organisations and other stakeholders develop appropriate and effective policies and actions for managing ASM in protected and sensitive ecosystems in Gabon.

To advance knowledge of ASM’s impacts in Gabon, and to advance best practice models for possible national application this national scoping study should look at

- ***The indirect effects of ASM in critical ecosystems in Gabon.*** The direct environmental impacts of ASM on waterways are known. Yet, what the effects of those impacts consequently entail on the flora and fauna are not well known. Even less is known regarding the long term impacts of artisanal mining on biodiversity. Key questions to consider will be: How, in which timeframe and up to what size of disturbed land does natural recovery of ecosystems occur? Do technical rehabilitation efforts of ASM sites contribute or hinder re-establishing of original biodiversity? This topic is worthy of devoted expert research and on-going monitoring.
- ***The use (or not) of mercury;*** While ASM is not known to be in use in Gabon and it was not observed to be in use in the study sites, given the high environmental stakes in Gabon it is worth additional investigation.
- ***The different modes of organisation of ASM.***

Key questions to consider as part of the national scoping study would be:

- Analyse existing structures for organising ASM and consider the rationale behind these (in which circumstances do they function or not).

- Consider the motives and driving forces for miners to organize?
- What types of incentives lead (or would lead) to self-organization by miners?
- How might miners be incentivised to organize?
- How difficult or costly would it be for ASM miners to organize into shareholder companies and acquire mining licenses under the small-scale legal regime in order to ensure their rights?

In addition to the national scoping, a stakeholders' capacity assessment will be needed. For long term planning purposes, a needs assessment of key stakeholders' capacity and enabling conditions for ESER artisanal gold mining in Gabon will be needed to look into the capacity of ASM stakeholders to fulfil their roles in advancing the above recommendations. This should be done after the recommendations have been considered and adapted into a strategic plan, in order to see what capacity building and enabling conditions are necessary to make the implementation of that plan a success.

The following topics can be integrated in the national scoping or be subject to separate studies, as we believe they will add significantly to a better understanding and improved management of the ASM sector in Gabon.

- ***Study and monitor the impacts of ASM on forest degradation in Gabon***⁵⁴
As the Gabonese government is taking the lead to use aerial footage to monitor deforestation, to monitor ASM impacts, aerial footage could be used by the Gabonese government and other key conservation stakeholders. Monitoring of the zone can help establish the amount of deforestation due to ASM. Emphasising the usefulness of such footage is the fact that Minkébé camp can be spotted on Google Earth while these are not the best satellite images available.
- ***The economic contribution of ASM to local and regional economies***, in addition to other impacts ASM has in these areas in order to understand the benefits ASM brings and also the interests vested in it continuing in these places.
- ***The presence, impacts and management options for ASM in (sustainably managed) forestry concessions in Gabon***
- ***Study the structure, relationships, and practices of the ASM pit owners of Minkébé***
In Gabon the notion of the 'ownership' of the pits is unique and varies from site to site. Given the importance of Minkébé as a protected area and the importance of the pit-owners role in ASM in the Minkébé camp, a deeper examination is warranted. One of the subjects of such a study would be to look at how pit owners interact. Do they strategize between each other? Did they inform each other of workers fired so that other pit owners would not re-hire these? Is there joint transport of the gold, pooling security resources? Are security resources pooled? How, if at all, were they involved with other commercial activities? How economically viable would a legalised ASM business be? Would the existing organisational model be the most effective?
- ***The push and pull elements for engagement with ivory poaching and the role of criminal networks therein and the past and present, involvement of the criminal networks driving the ivory poaching in ASM***
The report questions traditional assumptions linking ASM and ivory poaching. It finds reason to investigate the rationale behind the raise of ivory poaching and to investigate the potential role of criminal network and traders operating in the Minkébé region.

⁵⁴ The Index on Biodiversity Integrity (IBI) developed by FERMON might be a good starting tool for this

1. INTRODUCTION

“[Artisanal & Small-scale Mining’s (ASM)]...problems are commonly perceived as of a social nature, rather than strictly economic or environmental. While [...] on average ASM is significantly dirtier per unit of output than other types of mining, this is not always the case. Moreover, ASM is often economically viable, even when environmental costs are taken into consideration, suggesting that many of the solutions lie in the areas of environmental and economic policy. In general [...] the environmental effects of ASM can be quite small under specific circumstances and the serious dangers which exist could be remedied without jeopardizing the profitability of the enterprises.”⁵⁵

Gabon’s large forest landscapes remain in prime condition and are of high biodiversity value. The entire country can be classified as a ‘Critical Ecosystem’. However, artisanal and small-scale mining is growing in popularity and the environmental impacts of its practices and the subsistence activities of ASM populations can be severe and irreversible. There is a need to address ASM in Gabon immediately and strategically. Recognising that ASM can, however, play a significant role in local and national development, this report takes the pragmatic view that ASM cannot be eradicated and instead provides a situational analysis of ASM in Gabon today, along with recommendations to key stakeholders that would support making ASM more environmentally and socio-economically responsive – what is termed ‘ESER-ASM’ herein.⁵⁶ The underlying question guiding this report is therefore the following: *how, if, and under what circumstances can ASM activity coexist in critical ecosystems and its economic features promoted?*

Based on the interest of the Gabonese government and with support of the World Bank’s Programme on Forests (PROFOR), with this report the ASM-PACE programme – a joint initiative of global conservation organization WWF and development consultancy Estelle Levin Ltd. – aims to facilitate the design of an early “roadmap” for ASM stakeholders to attain Ecologically and Socio-Economically Responsive Artisanal and Small-scale Mining, hereafter referred to as ESER-ASM, in Gabon. While ASM-PACE can be a partner in such efforts, *if ESER-ASM is to be achieved and sustained, action must be driven and owned by State authorities with the meaningful inclusion of affected parties (ASM, communities, and conservation organisations)*. Therefore, while this report suggests next steps and guidance from ASM-ESER models achieved elsewhere, this implementation process must be led by those who will ultimately have regulatory and legal authority over operations and supported by those affected by it.

It is intended that the lessons learned from the Gabon case will feed into the development of sustainable responses both locally and in protected areas in other countries, either directly through ASM-PACE activities in conjunction with national or international partners or indirectly through information sharing (tools, guidance notes, and project reports).

Content

This report details a study of historical and contemporary ASM in Gabon. It qualitatively assesses the ecological, social, and economic impacts of ASM, the key motivations of miners, and the responses of affected stakeholders. It analyses past interventions that have sought to alter ASM activity in Gabon in order to determine reasons for their success (or failure). And it provides recommendations on how to bring about ESER-ASM in Gabon.

The report commences by describing the research methodology and limitations, it then provides a contextual background covering the ecological and the regulatory context of ASM, a history of ASM in Gabon, and examines previous government interventions in the sector. Critical concepts for ESER-ASM are explained, followed by the findings of the field research conducted in October 2011. Field research findings are divided into three chapters, each chapter dealing with one research site and each chapter provides details covering geology, social organisation, biodiversity, professional organisation, among other important contextual elements. This is followed by an examination of Sustainable Supply Chains (SSC) as an option in Gabon to achieve ESER-ASM. Conclusions are then drawn by triangulating the critical concepts in responsive gold supply chains with the findings of desk and field study. Finally, the report ends with tangible recommendations to achieve ESER-ASM in Gabon.

⁵⁶ Unless purposefully done so, this report refrains from using the phrases ‘sustainable’ and / or ‘fair’. Concerning the first, sustainable, the exploitation of a non-renewable natural resource can never be sustainable. Still, exploitation is possible with limited impact on biodiversity during operations and can even aim for neutral environmental in the long term. With regards to FAIR, as in FairTrade and FairMining standards, these concepts are defined concepts subject to certification and are not be used loosely.

2. METHODOLOGY

2.1 Research questions

The main research question guiding this report is: “In pursuit of ESER-ASM, and acknowledging, first, past interventions in the Minkébé, Longo and Ndangui artisanal mining zones in particular and in the ASM sector in Gabon in general, and secondly, the conservation objectives in Gabon, how can possible challenges in Gabon’s ASM sector be addressed?”

To answer the above, the report answers several sub-questions:

1. What is the history of state interventions in the ASM sector in Gabon?
2. What is the regulatory context of ASM in Gabon and where are the opportunities and challenges for enabling ESER-ASM therein?
3. How is ASM practiced in Gabon (using case studies of Minkébé, Longo, and Ndangui) and what are its impacts?
4. What are international benchmarks for ESER-ASM?
5. In recognition of international benchmarks, what gaps exist in ASM practice and policies?
6. In recognition of international benchmarks, current laws, and local realities, how can Gabon achieve ESER-ASM and successfully optimise the development potential of ASM whilst addressing and managing its environmental and social liabilities?

The research used selected methods from ASM-PACE’s methodological tool, which is designed purposefully for field-based research on ASM occurring in protected areas and critical ecosystems to provide baseline assessments of ASM sites to support ongoing monitoring and evaluation and the development of appropriate management responses. The toolkit is available via the ASM-PACE programme website, www.asm-pace.org.

2.2 Research process

This report is the concluding effort of a seven part process. Parts included:

1. Desk study analysing the history of ASM mining in Gabon, previous interventions, as well as the institutional and juridical context in which ASM in Gabon takes place;
2. Desk study and interviews focused on understanding the situation of ASM in Minkébé National Park;
3. Preliminary field visit to Longo and Ndangui to establish links with local stakeholders, initiate field research and lay the logistical groundwork for the subsequent phase of in-depth field research;
4. Field visit to Longo and Ndangui for rapid assessment studies and subsequent local validation of findings.
5. Interviews with other key ASM stakeholders in Gabon, including national-level government authorities and conservation organisations
6. Oral and written reporting
7. Consultation with key stakeholders to validate findings.

Recommendations for next steps are outlined in this report’s conclusion (Chapter 8).

2.3 Site selection

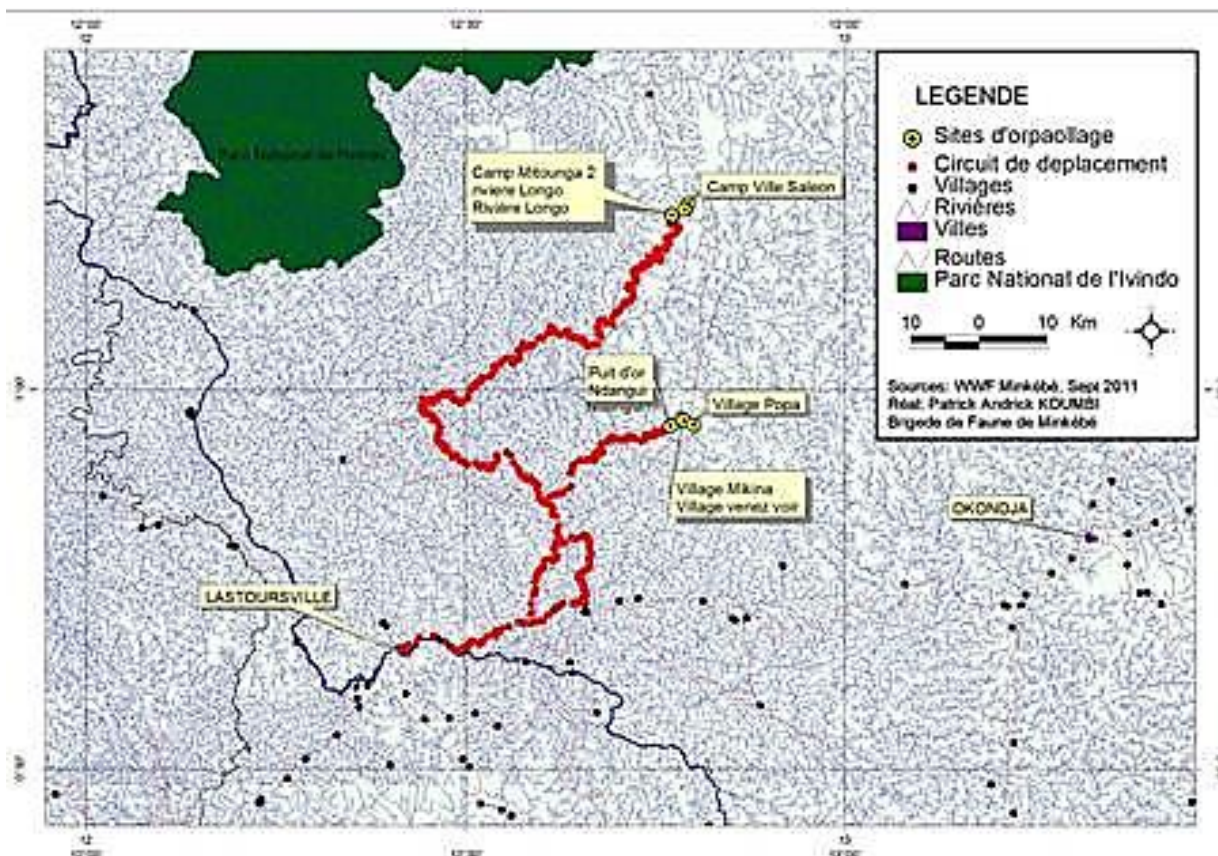


Figure 3: Indicates the trails the research team visited during the 2011 fieldwork.

Map courtesy of Koumbi Brigades of eaux & forêts, Minkébé

This report covers three ASM sites: Minkébé, Longo, and N'dangui. At the outset of the ASM-PACE project in Gabon, Minkébé mining camp and its satellite camps were to be the sole focus of research as case-study sites. This was owing to there being available ample information on the details of the park and the mining camps due to the facts that the Minkébé-zone camps are present in the buffer zone and within the borders of Minkébé National Park itself and that the landscape in which Minkébé National Park is situated has been a WWF conservation priority for more than twenty years. Perhaps more importantly, due to this long-term presence, WWF has established relations with key local stakeholders, which would allow more thorough research because field research there could be aimed at uncovering deeper and more complex issues since descriptive information was readily available. Finally, WWF had, in coordination with other stakeholders, previously attempted to curb ecological impacts of the artisanal mining in Minkébé so there is an array of lessons learned already.

However, soon after the ASM-PACE project commenced, in 2011 the authorities evicted the miners from Minkébé and the satellite camps in response to the thousands of illegal migrants living in the camps who were considered threats to both national security and conservation. The eviction involved the area being secured by the military and access for the project was not allowed. While it was decided Minkébé could still be used for the research by using the profuse reporting on the camp, the need to conduct additional field studies was acknowledged, primarily to get up-to-date and participative input from artisanal miners regarding their views on ASM in Gabon in general and on their ASM-related livelihoods in particular.

Following close consultation with the ANPN, the mining site of Longo was selected. A preliminary mission found Longo to be too small to put the developed tools from the draft ASM-PACE Methodological Tool adequately to the test. Consequently, it was decided to add N'dangui to the field study as this is a longstanding and well known artisanal mining area relatively close to the Longo site. Additionally, these sites differ significantly in terms of established social and administrative organisation. Key differences that are useful for research purposes include:

- Mining methods at the Minkébé site border on 'small-scale mining' because it is more capital intensive and better organized; the other two sites are distinctively exploited in more individual artisanal fashion;

- Ndangui is an official village and district with a school; Minkébé and Longo are clearly mining camps lacking official administrative stature and are, thus, deprived of certain social and administrative infrastructure that marks an 'official' village or even an 'unofficial' one.

Longo miners work their pits mostly under the canopies of the rainforest; Minkébé and Ndangui landscapes are marked by desolate excavations which are deserted or, for active mining sites, are reminiscent of lunar landscapes.

It should be noted that Longo is not situated within a national park or reserve but rather in a forestry concession which is in the process of obtaining a certificate for sustainable management (CFAD).⁵⁷ Hence the site enjoyed lower conservation protection status and hence less conservation requirement efforts and also there was limited secondary data for this site.

2.4 Methods used and data sources

The findings presented were gathered based on guidance from the draft ASM-PACE Methodological Toolkit, which has been purposefully designed for field-based research on ASM occurring in protected areas and critical ecosystems to provide baseline assessments of ASM sites to support ongoing monitoring and evaluation and the development of appropriate management responses. The toolkit is available via the ASM-PACE programme website, www.asm-pace.org.

The research draws from primary, secondary and tertiary data sources. In the following sub-paragraphs we will discuss the methodological use of our sources per source type.

2.4.1 Primary data: research missions, documents and resource persons

Primary data were obtained through analysis of historic and existing laws, as well as through fieldwork in Longo and Ndangui during two missions.

Mission One took place from September 10, 2011 to September 16, 2011. The research team for this mission consisted of: Serge Nguema (WWF-Gabon junior extractive industry advisor); Gustave Mabaza (WWF-Gabon, Minkébé Program Anthropologist and ASM specialist); Eric Obame (WWF-Gabon, Minkébé Program *aide-de-camp*); Jean Jerome Ovondo (ANPN, *Conservateur Adjoint Park Nationale Ivindo*); Jacques Nkoghe (ANPN); and Micha Hollestelle (Zaga Consultancy / Estelle Levin Ltd., ASM-PACE Gabon Coordinator, team leader).

Mission Two was executed from September 26, 2011 to October 5, 2011. With ANPN personnel unfortunately not available to join, the smaller team included: Gustave Mabaza (WWF-Gabon, Minkébé Program Anthropologist and ASM specialist); Micha Hollestelle (Zaga Consultancy / Estelle Levin Ltd., ASM-PACE Gabon Coordinator, team leader); Jean Noel Okogo (WWF-Gabon, Minkébé Program Logistician and research assistant); and Ruby Weinberg (Estelle Levin Ltd., researcher). Due to logistical issues beyond her control, Dr. Jennifer Hinton could not participate in the second research mission as initially planned. Nonetheless, her guidance during and contribution to the research preparations and the report undeniably make her a valuable team member.

For both missions, permission was sought and granted by the field team from national and local authorities. Prior to undertaking research in local communities, the field team met with community leaders to communicate the objectives of the mission, obtain their consent for research and transect walks, and agree on times, dates, and locations for focus groups.

Data was collected using the following tools of the ASM-PACE Methodological Toolkit: Transect walks, one per village / site; Unstructured topic based interviews; Informal conversations; Structured interviews using the ASM Checklist; Focus groups separate for men and women; Daily Calendars; Stakeholder analysis added with conflict assessment; Rapid Environmental Impact Assessment in participatory and non-participatory fashions; Reporting Back / Validation workshop. Transect walks were done in Ndangui and Longo. In the first mission to Longo, the smaller of the two sites, focus groups included 23 male miners and direct interviews included 6 women miners. In the second mission to Ndangui, focus groups included approximately 80-100 men between ages 16-70 and 40 women between 18-60 and were conducted in separate groups due to gender norms.

⁵⁷ See section 3.5 and Annex B for additional information about Gabonese forestry regulations.



Figure 4: Male focus group of artisanal gold diggers in Ndangui, La Chute in September 2011. Facilitated by Micha Hollestelle (pictured on the right-side).

Photo credit: R. Weinberg.

Since the research was a rapid, if not snap-shot, assessment of ASM, the objectives did not include any specific focus on children, and almost all children of school-going age are educated away from Longo and Ndangui, no effort was made to organise focus groups with children or youth. However, it was informally established that several miners in one mining site in particular were under-eighteen years old.

2.4.2 Acknowledgements on secondary data

Secondary sources that contributed substantially to the author's understanding include:

1. Reports of **Gustave Mabaza**, anthropologist of the WWF Minkébé project and those of **Koumbi** of the Ministry of Water & Forests, on Minkébé camp and other ASM camps in and around the Minkébé National Park. For nearly a decade Mr Mabaza and Mr Koumbi have surveyed the ASM developments in Minkébé camp and other ASM camps in and around the Minkébé National Park. This monitoring of the developments, particularly the growth of the population and effects on hunting and logging, has been the backbone of this report's section on Minkébé. While many of the reports on the Minkébé region were drafted and researched by Gustave Mabaza of WWF, who was part of the research team, as his reports were executed outside the realm of this project, the reports are considered to be secondary sources.
2. **Lahm, S.**, *L'orpaillage au nord-est du Gabon; historique et analyse socio-écologique*, 2002, Libreville, Gabon. Lahm's study provides an overview of the history of artisanal mining in Gabon with a focus on interventions in North Gabon.
3. **SOFRECO** (for la République Gabonaise & l'Union Européenne), *Rapport Final, PROJET N° 8 ACP GA 017, Appui au secteur minier – SYSMIN 8ème FED*, 2010, Libreville, Gabon. SOFRECO is a French consultancy which assisted in the implementation of the ASM component of SYSMIN programmes. SYSMIN is a programme of the European Union (EU) geared towards the enhancement of the mining sector in the former colonies of EU member states represented in the Cotonou framework, previously called the Lomé agreements.
4. **Evao Conseil** (WWF-Gabon) *Gestion durable du secteur minier en Afrique Central; Analyse de l'environnement réglementaire du secteur au Gabon*, 2010, Libreville, Gabon. *Principal contribution*: Analysis of Gabonese mining legislation with a view on sustainability concerns
5. **Claude Laroche**, the second director of the *Société Gabonaise de Recherche et d'Exploitation Minière* (SOGAREM) after independence of Gabon in 1960. *Principal contribution*: reports on the specificities of one year of SOGAREM operations.

The information these sources provided was supplemented by additional secondary data from:

- Research and field visit reports of ANPN, WWF-Gabon and WCS Gabon
- Policy reports and related publications on conservation in Gabon and the larger Congo Basin
- Mission reports from WCS and ANPN joint anti-poaching missions to Longo
- Research, policy reports, and contributions from J.J. Hinton, F. Hruschka and E. Levin
- Journal articles and academic works with emphasis on ASM impacts
- Internet sites on ASM standards

2.5 Research challenges

Site selection

As referenced in section 2.3, the original research site was to be Minkébé camp, but following an eviction of miners from that site, additional research sites of Ndangui and Longo were selected. This change of site did have timeframe and budget impacts as researchers had to alter site plans. However, despite the fact that researchers were unable to access the Minkébé site due to security restrictions, they were able to collect a significant amount of data on ASM practices there thanks to WWF's previous assessments there over the past ten years.

Participation challenges

Focus groups were done in separate gender groups. Original research design had a mixed focus group structure, including young and old, men and women. However it was discovered in the first mission to Longo that local custom dictates that women do not participate when part of a male group discussion. When the matter was explored, local experts stated the local culture does not allow for mixed gender groups. This was independently confirmed by local male and female respondents, and consequently, it was decided for the second mission to have separate focus groups for men and women. During the first mission, interviews with women present in Longo were used to overcome the gender sampling bias.

While the women in Longo were very vocal and enjoyed being given a podium and being heard in a separate focus group, women in Ndangui responded more reluctantly. Indeed, the female focus groups had relatively low participation in Ndangui. In the village of Poppa there was a rift between two groups of women that hampered the focus group. In La Chute reasons given were that women were too busy and that men were to attend to these things; some women in La Chute wondered why they needed to be taken from their work to do the work that men should be doing. By participating in the focus group, they felt they were doing both women's *and* men's jobs.

All shopkeepers in Ngandgui are West African and they chose not to actively engage in the focus groups. This disallowed researchers from directly comparing their views, opinions, and experiences with that of the miners. However, shopkeepers did agree to informal topic-guided interviews. Therefore the research team feels the role and social position of shopkeepers is covered to the maximum extent possible.

Lastly, due to the lack of baseline information regarding wildlife and flora in and around the camps in Minkébé, Longo and Ndangui, environmental impacts could not be measured over time. What is more, as a theoretical matter, the distinction between the impact of ASM per se and the impact of human beings making use of forest resources for their livelihoods remained debatable as will be further discussed in the report.

2.6 Intended next steps: Building a roadmap for ESER-ASM in Gabon

This report is intended to be used as a starting point for designing a roadmap towards ESER-ASM in Gabon supported by relevant stakeholders, and in particular by the ANPN and the Gabonese Ministry of Mines, which has expressed an interest in this subject. The roadmap process could most likely begin with a workshop in which key stakeholders could consider the recommendations in this report and explore the following questions:

1. Are there other actions that should be considered besides those recommended herein?
2. Of this full suite of possible interventions, which are deemed likely to be most effective and feasible for gradually establishing ESER-ASM in Gabon in the short-, medium- and long-term?
3. What further information is necessary to inform this decision-making?
4. What steps need to be taken and by whom in order to build a stakeholder-owned framework for action?
5. What resources are necessary, and where might these be found, for driving this process forward?

3. ASM AND CONSERVATION IN GABON

This chapter briefly provides a background to ASM, followed by a background on Gabon, and then provides an historical overview of interventions in the ASM gold sector in Gabon from independence to date.

3.1 ASM: A brief background⁵⁸

Internationally, ASM is increasingly recognized by governments, civil society and communities for its potential to support local and national development.⁵⁹ Main contributions largely relate to provision of livelihoods, particularly in areas where comparably beneficial alternatives are lacking, and the spin-off benefits related to the injection of ASM revenues into local micro-, small- and medium enterprises (SMME) as well as agriculture.⁶⁰ Cumulatively, contributions to GDP and foreign exchange earnings can be substantial at regional and national levels, although this is largely not captured in official statistics, as most ASM is informal.

Despite this potential, ASM around the world is also commonly characterized by environmental degradation, social disruption, child labour and a host of other negative attributes. The informal status of ASM often only benefits politically well linked economically powerful groups engaged in illicit trade, by keeping ASM in a condition of dependency and increasing profit margins.⁶¹ Basic techniques commonly used in artisanal gold mining around the world are outlined in this report's Annex A.

Numerous countries, amongst which are many African ones, are now seeking to redress and mitigate the implications of ASM and catalyse its development potential.⁶² In all cases, success of such a redress will largely depend on organisation and *formalisation* of ASM and the downstream trading chain, introduction of environmentally-responsible and socially beneficial methods and approaches and increasing the economic contributions of the sector. Lessons learned from efforts in over 20 countries around the globe indicate that transformation of ASM typically requires:⁶³

- Conducive policies, laws and regulations, and the political will and institutional commitment to implement them;
- Strong inter- and intra- sectoral coordination, including between central and local authorities in the different relevant sectors (e.g. mining, environment, social welfare);
- Genuine, gender-responsive engagement and empowerment of local communities, inclusive of public sector, civil society, miners and their families;
- Strategies to professionalize ASM and increase benefits from formalization, inclusive of efforts to build requisite capacity, establish suitable financing mechanisms, strengthen ASM organizations and introduce environmentally-responsible, appropriate, intermediate technologies and methods;
- Support for harmonious co-existences between ASM and large scale and exploration companies.

While efforts to advance the ASM subsector have drastically increased over the past two decades, real progress has remained largely elusive in most jurisdictions. This is mainly because many countries implement only elements of the multi-pronged strategies needed. Furthermore, the producer level is commonly targeted while other downstream and lateral components of the production and trading chain are typically overlooked. As such, establishment of Sustainable Supply Chains (SSC) has increasingly become one of the cornerstones of multi-pronged strategies to effectively professionalize, manage, regulate and increase benefits from the ASM supply chain; this is further discussed in this report's chapter 7.

3.1.1 A framework for ESER-ASM

Artisanal and small-scale mining refers to mineral extraction at a lower technological, non-industrial level, relying mainly on manual work and craftsmanship of the miner. As such, ASM compares to other artisanal professions and

⁵⁸ This section was written by Felix Hruschka and edited by this report's author (Hollestelle).

⁵⁹ Hinton, J., 2011, International Best Practice In Formation, Strengthening & Performance Of Artisanal & Small-scale Mining Organizations, Report to Swiss Development and Cooperation Agency (SDC), Support to Artisanal Mining (SAM) Project, 51p.

⁶⁰ Hinton, J., 2011, International Best Practice In Formation, Strengthening & Performance Of Artisanal & Small-scale Mining Organizations, Report to Swiss Development and Cooperation Agency (SDC), Support to Artisanal Mining (SAM) Project, 51p.

⁶¹ Hruschka, F., C. Echavarría, 2011, Rock-solid chances for responsible artisanal mining. ARM Series on Responsible ASM No. 3, 35p.

⁶² Hinton, J., 2011, op cit

⁶³ Hinton, J., 2011, op cit

the related industries, like tailor to textile industry, carpenter to furniture industry, or farmer to agro industry. The main difference to other professions is that the raw material is a non-renewable resource, which therefore deserves and demands a particularly responsible handling. Additional differences are potential resource usage conflicts (with agriculture, conservation, large industry, etc.) and the occasional expectation of extraordinary income opportunities (gold rushes). Furthermore ASM suffers the consequences of the negative reputation of the Extractive Industries Sector as a whole in the public eye.

Nevertheless, as any artisanal or industrial endeavour, ASM is an economic activity, which needs to be performed in a responsible manner, minimizing negative social and environmental impacts. These expectations are often characterized as “Responsible ASM”. In the context of the present report they are referred to as “Ecologically and Socio-Economically Responsive Artisanal and Small-scale Mining” (ESER-ASM). In short, ESER-ASM is generally seen as a desired economic activity contributing to income and local development, while irresponsible ASM is widely rejected by governments and the public.

3.1.2 Types of ASM

Four types of ASM can be broadly observed⁶⁴:

- i. **Permanent ASM.** Full time, year round activity. Mining is frequently the only economic activity and is sometimes accompanied by other activities like farming, herding or other extractive tasks of indigenous groups.
- ii. **Seasonal ASM.** Seasonal alternating of activities or seasonal migration of people into artisanal mining areas during idle agricultural periods to supplement their annual incomes.
- iii. **Shock-push ASM.** A poverty driven activity emerging after recent loss of employment in other sectors, conflicts or natural disasters. Many of the individuals, mostly itinerant and poorly educated, have no other options and remain trapped in the poverty cycle.
- iv. **Rush-type ASM.** Massive migration based on the perception that the expected income opportunity from a recently discovered deposit far exceeds the current actual income of the people who are lured into it. It is not uncommon to observe former rush areas converting into new communities and rush miners converting into settlers. The rising price of gold plays a key role in the exacerbation of rush mining.

Permanent and seasonal ASM is usually carried out by the local population, building their own livelihood strategy upon the mineral resources within their communal territory. Permanent and seasonal ASM are therefore often also referred to as “community mining”⁶⁵. As it is in the interest of local communities to minimize negative social and environmental impacts, community mining has the highest potential to be or to become ESER-ASM.

Shock-push ASM is itself a response to economic, social or environmental impacts. As long as the root cause persists, shock-push ASM has little chances to become ESER-ASM. Rush-type situations are extremely difficult to control and miners lured into gold rushes usually have little consideration for social or environmental concerns. Rush-type ASM is not ESER-ASM. However, rush-type and shock-push artisanal mining have the potential to convert temporary miners into settlers who create new communities and convert to community mining.⁶⁶

3.1.3 Characteristics of ESER-ASM

The RESPOMIN Latin American network and the Alliance for Responsible Mining (ARM), have devised a set of “Principles for Responsible ASM”, which is widely recognized as a reference point.⁶⁷ ESER-ASM should conform to these principles or exceed them, as outlined in the below adaptation of these principles:

Human rights: ESER-ASM respects the human rights, as well as the social, economic, cultural, and labour rights of each and every person involved or affected. This specifically includes the rights of women, disadvantaged groups and individuals, including migrant workers. The rights of artisanal and small-scale miners must equally be respected.

Decent work: ESER-ASM is decent work in line with the ILO Conventions. Work in ESER-ASM is performed in conditions of freedom, equality, safety, and human dignity, is free of child labour and allows the access of all workers and their families to a decent standard of living.

⁶⁴ Weber-Fahr, M., J.E. Strongman, R. Kunanayagam, G. McMahon, and C. Sheldon.: Mining. Volume 2 — Macroeconomic and Sectoral Approaches, World Bank, Washington DC, USA 2002.

⁶⁵ Hruschka, F., C. Echavarría, 2011, Rock-solid chances for responsible artisanal mining. ARM Series on Responsible ASM No. 3, 35p.

⁶⁶ Ibid.

⁶⁷ Alliance for Responsible Mining. (Echavarría, C. et. al. Eds.): The Golden Vein – A guide to responsible artisanal and small-scale mining. ARM Series on Responsible ASM No. 1. First Edition in English, Medellín, Colombia, 2008.

Quality of life and sustainable human development: ESER-ASM contributes to the sustainable human development of communities and improves the quality of life of men and women miners, their families, and the community that hosts ASM endeavours, respecting the values and priorities of each community. ESER-ASM performs the extraction of mineral resources in a way that does not limit or that even enhances the development opportunities of future generations.

Legality: ESER-ASM complies with national legal frameworks. Where national legislation does not regulate ASM, responsible ASM miners engage with national governments, to lobby for improved public policies for enabling ESER-ASM. ESER-ASM is not involved in illegal financial transactions or armed conflicts in any way, including financing conflicts or the use of revenues to engage in such activities.

Environmental stewardship: ESER-ASM actively encourages better preventative and restorative environmental practices and the application of responsible methods of production. ESER-ASM miners abide by the environmental laws, contribute to environmental protection, human health and ecological restoration in their operations and communities, and mitigate negative impacts. Respecting protected areas, avoiding damaging important biodiversity, minimizing the ecological footprint of mining, and, where possible, restoring, replacing, or compensating for the loss of biodiversity are principles for environmental protection. Considering the mineral deposit a unique gift of nature, ESER-ASM makes all reasonable efforts towards integral resource usage and minimization of mineral losses.

Gender equality: In ESER-ASM, women’s work is properly valued and rewarded and equality should exist among men and women in all rights, including access to resources, salaries and wages, the use of earnings, and participation and impact on decision-making processes.

Multicultural nature: Where indigenous peoples or other ethnic groups are owners of the territory and are different from the miners themselves, ESER-ASM acts according to the spirit of ILO Convention 169, respecting local cultural values and practices, and reaching agreements regarding the impacts and benefits of mining operations in that indigenous or ethnic territory.

3.2 Gabon country profile

Gabon is located on the equator on the west coast of Africa. Its surface measures roughly 267,000 km² and is inhabited by a population of 1.53 million people. With six inhabitants per square kilometre, Gabon ranks as low as 220th out of 238 on the list of most populated countries in the world. Approximately 850,000 people live in the capital Libreville, and the economic hub Port-Gentil, both located at the coast. Gabon has been dubbed the ‘African Emirates’, referring to its heavy dependence on oil for government revenue; however from a poverty and development perspective Gabon does not compare favourably to the Emirates.



Figure 5: Map of Gabon.

Source: UN Dept. of Peacekeeping Operations

3.2.1 Wealth distribution

Gabon's GDP is as high as 13 billion USD, leading to a GDP per capita of 8,643 USD in 2010.⁶⁸ Following World Bank classification, Gabon's GDP falls within the 3,976 - 12,275 USD bandwidth of upper middle income countries. For comparison, the BRICS countries South Africa and India both have lower GDPs per capita, respectively 7,275 USD and 1,475 USD. What is more, China also scores well underneath the Gabon rating at 4,428 USD in that same year. Gabon also outranks many fellow Sub-Saharan countries in many international rankings such as the Human Development Index (HDI), where it ranked 106 out of 187 on the 2011 HDI. An estimated 4.8 per cent of the population lives of less than 1.25 USD per day while 19.6 per cent lives of less than 2 USD a day. However, when one examines multidimensional indicators of poverty, such as the Oxford Multidimensional Poverty Index (MPI) that takes into account government performance by considering key aspects such as sanitation and child mortality, Gabon's percentage of poor (which, by this measure means those people deprived of over 33 per cent of such indicators) are at 35.4 per cent in calendar year 2011. For comparison, in South Africa, while 17.4 per cent of the population lives on less than 1.25 USD per day, 'only' 13.4 per cent of its population is MPI poor. Gabon's score is positively influenced by its relatively high participation in education, in turn explained by an urbanisation rate of over 86.4 percent.⁶⁹ Due to the low population numbers and the windfall of oil profits, Gabon's income per capita is very high indeed when compared to its Sub-Saharan counterparts. However, while oil benefits may have lifted the nation out of poverty by GDP measures, other indicators reveal that the benefits have not yet reached its wider population.

3.2.2 Economy & employment

With an unemployment rate of 21 per cent, jobs are notably not easy to come by for most Gabonese.⁷⁰ This is somewhat surprising given the numerous West African immigrants in Gabon who do find employment, albeit mostly informal, as taxi drivers, shopkeepers, plumbers, etc. Indeed, Gabonese people prefer white collar jobs over blue collar.⁷¹ Still, most Gabonese people lack the educational background for highly skilled and managerial jobs. Indeed, 42.7 per cent of Gabonese firms identified 'an inadequately educated workforce as a major constraint'.⁷² Many of those who do have those skills have migrated to France, Canada and the United States.

Small, micro and medium enterprises (SMMEs) make up for 8 per cent of the official GDP. Yet, as in many developmental countries, SMMEs in Gabon are mostly informal. What is more, many of the shops and restaurants are run by foreigners of non-Gabonese African or Lebanese descent. Informal SMMEs are challenged by police harassment, corruption, a relatively small mid and up-market clientele, and by high import taxes rendering all expensive.⁷³ High import taxes (for some products over 50 per cent) also foster an intensive evasion of import taxes, further undermining chances for a viable formal SMME. Due to the challenges, the low turnovers, and remittance economy in which many informal shopkeepers are involved, SMME tend to invest little and hence create little structural employment. SMME, and industry at that, are also challenged by decades of quasi state-capitalism combined with a deficient educational system that has made the government the employer of choice. In turn, it has made the government notably inefficient and bureaucratic, populated by too many employees of which too many lack sufficient skills.⁷⁴

One could argue that these job creation challenges result from the most essential macroeconomic problem-- "Dutch Disease"-- named after the economic effects of the gas bonanza in the Netherlands in the 1970s. In short, the influx of foreign exchange leads to an increase in consumer demand, then leading to inflation, then to changes in relative prices which favour non-traded goods (e.g. services). Sectors for traded goods decline, thus leaving an undiversified economy with no industry to speak of besides oil. A windfall income stream to the government also leads to a lack of incentives to encourage economic diversification. Indeed, the economy is lopsided as in 2010 crude petroleum production accounted for about 75 per cent of the country's total exports, 60 per cent of Government revenue, and 40 per cent of the country's gross domestic product. The other biggest sectors of the economy are also raw materials and export oriented; these include forestry and large-scale manganese mining.

To further the diversification of the economy, the current administration sees three pillars for an 'emerging Gabon' (*Gabon Emergence*): services, industry and Gabon's large tropical forest cover and rich biodiversity (*Le Gabon Vert*).

⁶⁸ <http://data.worldbank.org/country/gabon?display=graph>

⁶⁹ <http://hdr.undp.org/en/statistics/>

⁷⁰ <https://www.cia.gov/library/publications/the-world-factbook/geos/gb.html>

⁷¹ Interviews between Hollestelle and CEOs, senior managers and other business leaders, both Gabonese and Western

⁷² World Bank Enterprise Surveys <http://www.enterprisesurveys.org/Data/ExploreEconomies/2009/gabon#workforce>

⁷³ Personal communication between Hollestelle and various experts

⁷⁴ The president, Ali Bongo Ondimba has repeatedly referred to this problem in speeches, lately in his Labour Day speech to the higher administrative echelon.

This has resulted in several initiatives. In the forestry sector, the Gabonese government has recently fast tracked forestry companies' longstanding targets to invest in saw mills and even plywood production centres to enlarge the Gabonese timber value chain. To 'stimulate' the sector to live up to this commitment, as of 2010 unprocessed timber is no longer allowed to be exported. Large scale plans have also been presented for the revitalisation of agriculture; cacao and coffee were once major export products. The government is promoting access to micro-credit, technical assistance, development of commercialisation infrastructure in hopes of turning from an importer of fruit and vegetables to an exporter of agricultural products. However, in terms of GDP rather than in terms of jobs, the sector with the highest hopes for Gabon's income diversification is the mining sector. However, the existing artisanal mining sector has been left to its own devices since the late 1990s and hence has largely not provided income streams for the national government. Additionally, with the exception of the long-standing exploitation of manganese around Franceville, Gabon's large-scale mining (LSM) sector is nascent at best. Given that it can easily take ten years from exploration of concessions to full operation of mines, the hoped-for jobs, infrastructure and other development, which the large scale mining sector is expected to deliver on, are at best on the far horizon (see also the paragraph below on large scale mining). Though the current administration aims to diversify the economy, without a proper restructuring of the educational system, not in the least the technical and vocational training element, the unemployment rate will continue to remain high. Furthermore, with over twenty-two million hectares of forest, equalling 85 per cent of its terrestrial territory, diversifying the economy by encouraging agriculture, timber, and mining will likely come at a price to be paid for by the environment.

If these poverty and employment numbers and challenges show one thing, in the light of this report, it is that ASM offers a credible opportunity for those who are not connected or skilled enough to land other jobs, if these jobs are available at all. But even the informal income opportunity of ASM faces a threat: the ambition of the current government to open up the country's interior for industrial, large scale mining, whose concessions overlap with traditional ASM sites.

3.2.3 Large-scale mining (LSM) sector

Manganese is historically Gabon's primary mineral commodity. In Moanda, in South East Gabon near Franceville, Comilog had been mining manganese since before Gabonese independence. South of Moanda, a recent gold mining operation by Managem/ SearchGold has started production. While the concession is large, with fewer than 200 employees, the activities are not yet that expansive.

With the growth in industrial mining, ASM and LSM are increasingly overlapping. Figure 6 is the most recent map available from the Gabonese Ministry of Mines that shows all outstanding mining permits; it indicates that a total of nearly twenty thousand square kilometres (20,000 km²), or roughly 7.5 per cent of the total surface of Gabon being subject to exploration for gold. Research sites Ndangui and Longo are indicated in the southern red circle and Minkébé is indicated by the northern red circle; all are situated in or adjacent to gold-related exploration concessions. Covering Ndangui is a permit to explore for gold and related metals held by Ivanhoe Gabon SA. So as to find gold, copper, lead and zinc, G2-320 Goldstone Research Limited Gabon holds an exploration permit covering the Longo ASM site. As such it is not unique in that concession G2-291 is under research by Areva, looking for uranium and rare earths. Other mining companies, such as Anglo Gold Ashanti, confirmed to the lead researcher a presence of ASM miners on their exploration concession too. The G2-270 permit of Resources Golden Gram in Bakoudou used to be subject to ASM in the late fifties. Most notably absent is a permit to explore for gold in the Minkébé region. This is explained by the presence of Comibel's large iron ore exploitation concession of over 7000 km² which borders straight on Minkébé National Park, covering the Minkébé ASM camp. In sum, the overlap between ASM and LSM activity is one that needs to be addressed by thoughtful policy.

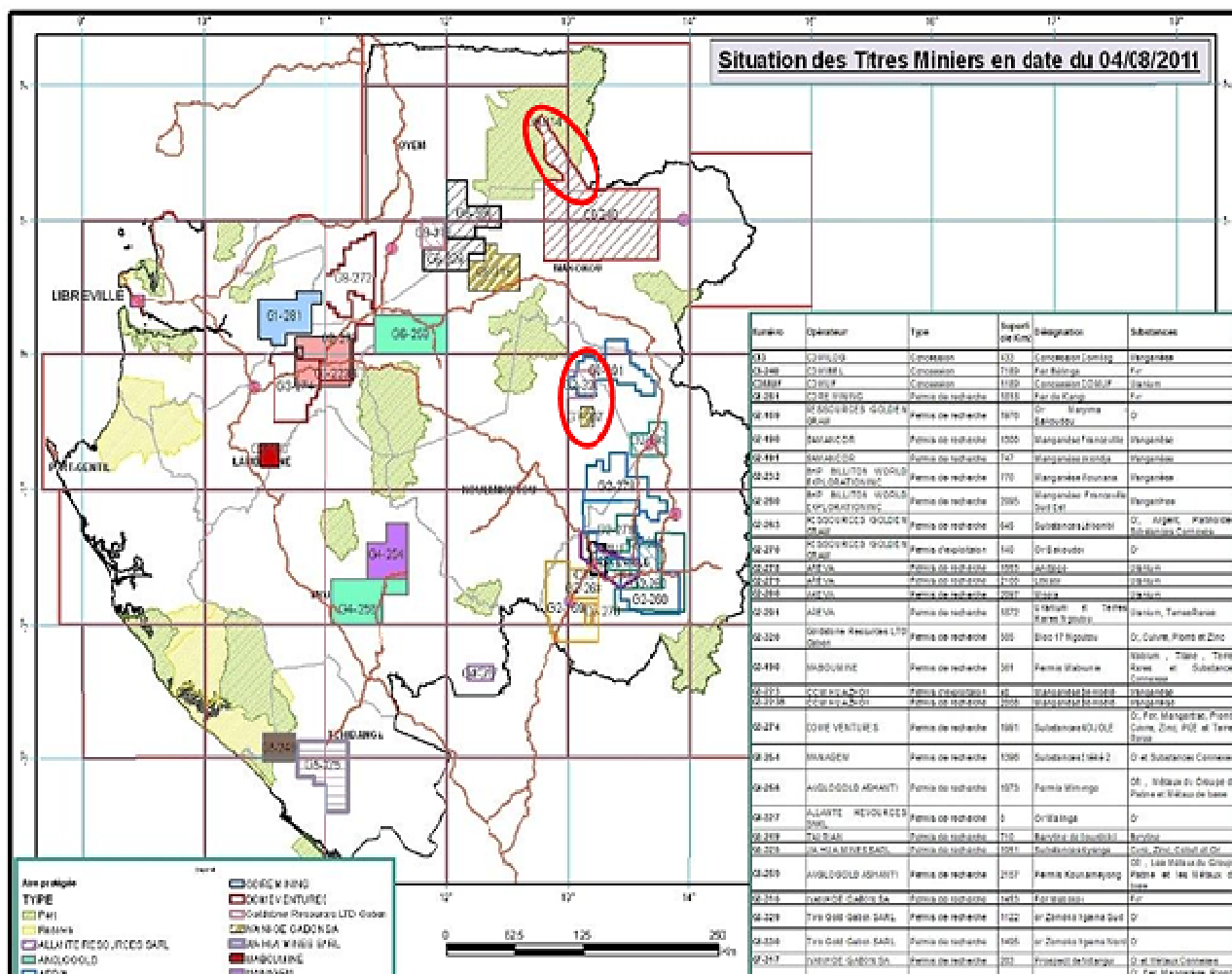


Figure 6: Mining permits in Gabon, August 2011

3.2.4 Geology and mineral resources of Gabon⁷⁵

“Precambrian” is the name of the first geologic period that spans from the formation of Earth around 4,600 million years ago to the beginning of the Cambrian Period, about 540 million years ago. Precambrian is further divided into the Archean (older than 2,500 million years) and Proterozoic (2,500 – 540 million years) period (“eon”), which are further subdivided into three shorter periods (“era”) named with the prefixes paleo, meso, and neo.

During the Archean, the world’s landmass was concentrated as one single supercontinent of mainly granitic rocks and the atmosphere was free of oxygen. With the appearance of algae and the subsequent change of the earth’s atmosphere during the Proterozoic, oxidization processes and precipitation of metals started to occur. It took tens to hundreds of millions years until the oxygen content of the atmosphere began to stabilize. Periods of higher and lower oxygen contents of that eon can still be observed in rocks of the so called “banded iron formations” (BIF), which represent Gabon’s major mineral resources of iron and manganese.

⁷⁵ This section was written by Felix Hruschka and edited by the author (Hollestelle).

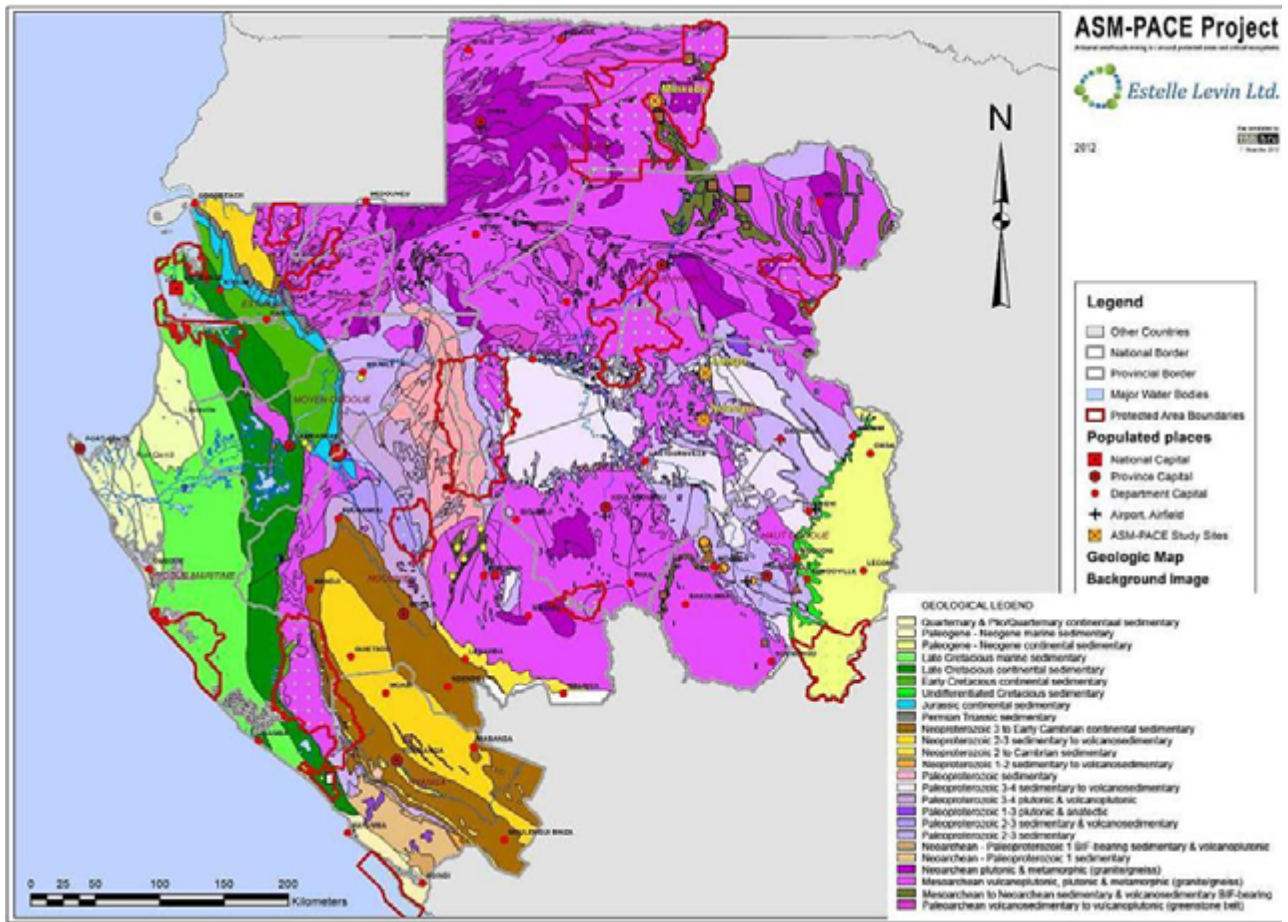


Figure 7: Geologic sketch map of Gabon.

Created for this report by F. Hruschka

Volcanism was very active during the Precambrian super-eon and appeared along fracture lines (volcanic belts). The volcanic rocks were mainly Basalt and similar mafic and ultramafic (low silica) rocks, and sediments formed by such rocks. It is important to note that volcanism often transports high metal contents from the inner Earth mantle into higher strata. Most of such former volcanic belts were later re-exposed to heat and pressure by tectonic processes. This transformed the granite host rock into gneiss and the volcanic rocks into “greenstone”, named after its characteristic colour. Such greenstones still appear in form of “greenstone belts” along old fracture lines, up to tens of kilometres wide and up to hundreds of kilometres long. Due to their volcanic origin these greenstone belts are very rich in metals, particularly gold.

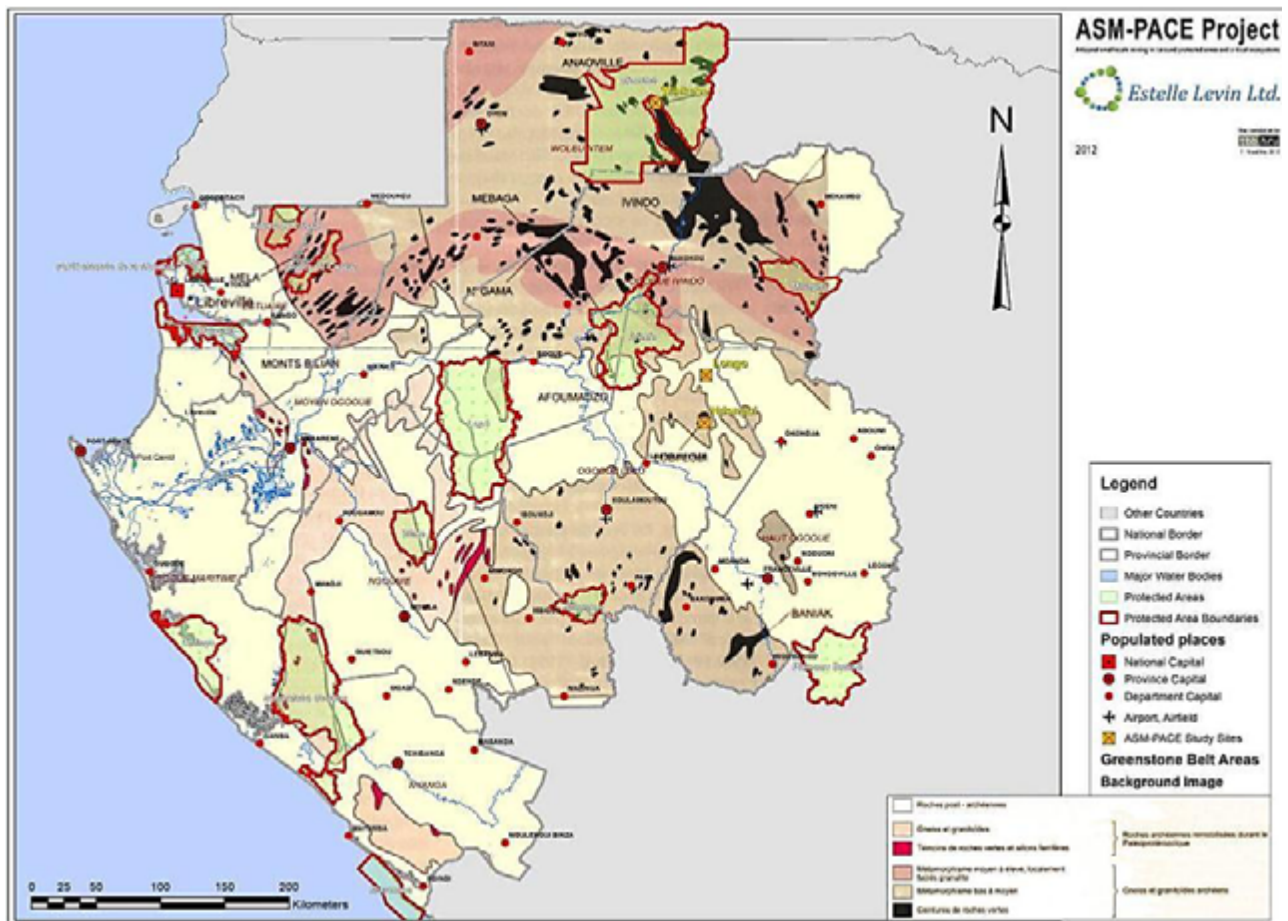


Figure 8: Sketch map of Gabonese Greenstone belts (black) and major BIF formations (magenta).
 Created for this report by F. Hruschka

At about 1000 million years ago, the Archean supercontinent began to break up into continental plates, of which the original Archean landmass usually formed the central, stable parts (called continental shield or “craton”). These cratons can nowadays be found in all continents, but particularly Africa is mostly formed by cratons. Some gold deposits in Gabon are reported to share very similar characteristics with Tanzanian deposits. Similar mineral deposits as in Africa and in Gabon (BIF and gold from greenstone belts) can also be found in countries like Brazil, in Australia, the Canadian Shield in Northern America, and many other places.

As can be seen from the geologic sketch maps (see Figures 7 and 8), most of Gabon consists of exposed Precambrian rocks. The main mineral resources of Gabon, consistent with the above described geologic origin, are iron and manganese ores, as well as gold within the Archean and Proterozoic formations. The coastal area is covered with cretaceous and younger formations, which contain Gabon’s hydrocarbon resources. The geologic sketch maps also indicate protected areas (red outlines). Visibly, the delimitation of protected areas aimed for avoiding resource usage conflicts from the outset by not including the most prospective mineralized zones (such as the Minkébé mining zone and others) into protected areas.

3.3 History of ASM in Gabon to date

The first gold mining camps were founded by commercial French miners as gold had neither meaning nor value in local cultures.⁷⁶ Other Europeans and Africans followed soon after.⁷⁷ Though these were sites run by more or less advanced companies, until the recent arrival of Managem in Bakoundou, gold mining has never been anything but artisanal for as far as the records show.

3.3.1 Gold production since independence

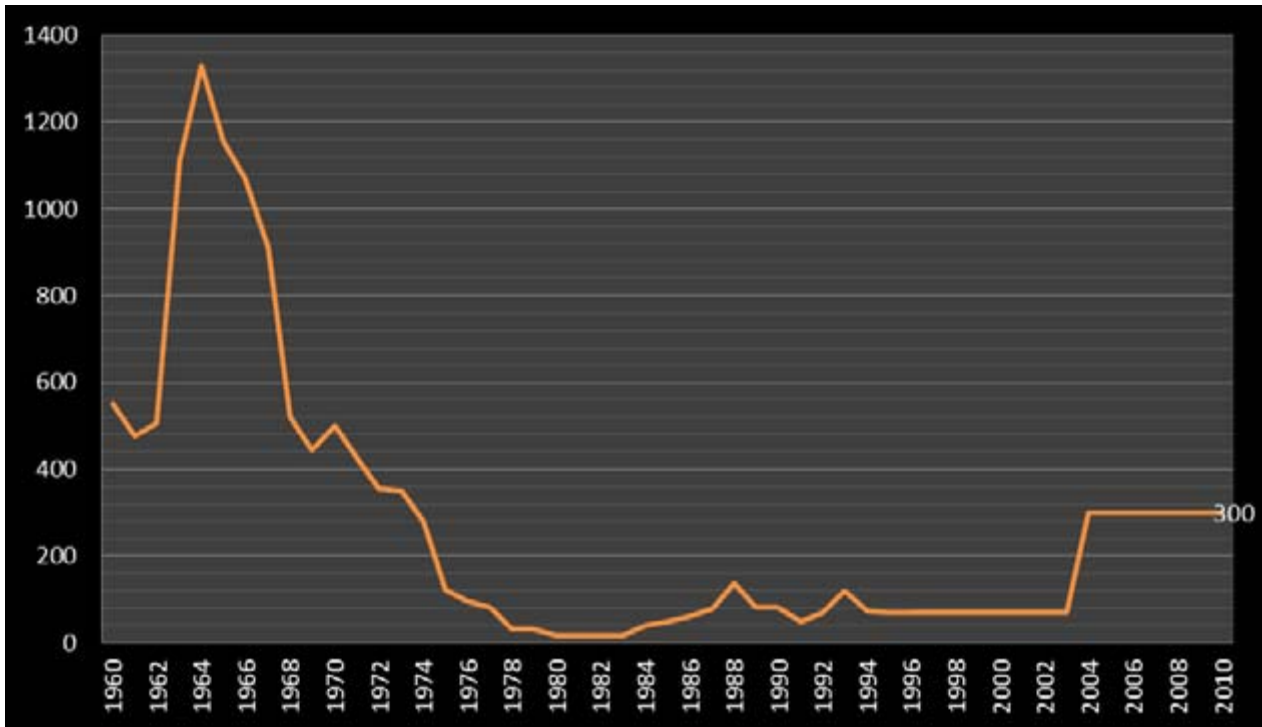


Figure 9: Reported gold production Gabon 1960 – 2010.

Source USGS.⁷⁸

Using the US Geological Survey Mineral Yearbook data, Figure 9 displays the gold production as it was reported to the Mineral Yearbook by the Gabon Government. Five things are distinctly noticeable:

1. The high in the mid-1960's and peaking at 1330kg. It was in this period in that the ASM gold site of Ndangui began operations.
2. The steady increase and then decline from 1983 to 1990. As discussed later in this report, this was the '*période Gilbert*' in which, using the outfit of Mr Gilbert, the state furnished ASM sites with tools, food, medicines etc, while collecting the gold on site at fixed prices.
3. The flat line at round about 100kg from 1990 onwards, which then bumped up a bit to 300kg in 2004 after which it remained flat. Once more, the only explanation found for this consistent low yield is a failure from the state to secure the gold. As a matter of fact the US Geological Survey Mineral Yearbook's chapters on Gabon habitually mention that for the gold production figures to be understood one needs to bear in mind that approximately 400kg of gold is smuggled out of the country per year.⁷⁹ SOFRECO subscribes to the argument of smuggling and adds that an additional unknown amount of untraced gold ends up in the national trade, mostly for jewellers.⁸⁰
4. The mentioned tripling of the reported production from 100kg in 2003 to 300kg in 2004. As an explanation one may bear in mind that in this period Gabon re-engaged in the ASM sector through the SYSMIN project. The field visits of the Ministry of Mines related to the project may have resulted in a higher gold yields.⁸¹ Most puzzling about the 300kg is the fact that the yield is so much more than what was collected during the '*période Gilbert*

⁷⁶ Cinnamon, J., Counting and recounting in Northern Gabon, 2010 & Lahm, S.

⁷⁷ Lahm

⁷⁸ US Geological Survey Mineral Yearbook, International Volumes 1960-2011, chapters on Gabon

⁷⁹ US Geological Survey Mineral Yearbook, International Volumes 1960-2011, chapters on Gabon

⁸⁰ SOFRECO 2010

⁸¹ That said, the project did not have field visits every year while even the SYSMIN report of SOFRECO, co-drafted by the chief of the ASM relevant service within the Ministry of Mines, mentions annual visits to all sites to be impossible given the current staffing

while during that period gold was collected monthly or at least very regularly. Also, it was collected in all known ASM zones. One cannot but conclude that either the 300kg is wrong or the reporting from the *période Gilbert* is incorrect. Most likely, both do not reflect reality as a total production of 300kg of the large and well established ASM zones of Minkébé, Mintzic, Ndjolé, Ndangui and Ètèké put together appears low. At its height, the camps in the Minkébé finger shape zone alone housed over 5,000 miners.⁸² Conservatively assuming a total of 1,000 miners in the other zones put together, 300kg means a production of 1.25 grams per week based on 40 working weeks, or else significant production that left the area outside of official channels. Likely the flat lines further indicate incapacity of the relevant state institutions to properly collect or report.

5. Even if the gold were properly collected and reported every year, it still seems odd that, besides the hike in 2004, gold yields would remain flat; 100kg from 1994 to 2003 and 300kg from 2004 onwards. No variation at all makes sense only if there was to be some production cap, which there has never been.

3.3.2 Before independence

For as far as the records show, gold mining in Gabon started in 1938 by *La Société Or-Gabon Micounzou* in the Chaillu Mountains, around Etéké, east of Moulia in Ngounie province (mid-South East Gabon, see also Figure 5 in this report's section 3.2). The zone is since referred to as Etéke, after the village in the heart of the mining region where it all started. The same company is reported to also have mined diamonds nearby in the Pounga – Etéké zone between 1950 and 1959.⁸³ In fact, some artisanal miners in Longo, who said they had worked in the region, claimed diamonds were still being mined there, albeit only in small quantities. In that same period, in Makongonio (Ngounie province, between Ndendé et Mbigou) a total of 40,000 carats of diamonds were also mined by *La Société SOREDIA*, a subsidiary of *la Compagnie Minière de l'Oubangui Oriental*, which held its headquarters in the Central African Republic. In the Minkébé forest region, artisanal gold mining was started by a French forester named Ferdinand Roux.⁸⁴ Roux established a camp called Ambe, some forty kilometres northeast of Makokou. At the time of writing, the camp still exists. Roux and his Gabonese counterpart Samuel Issezi went on north of Ambe to establish more camps. In the same province as Roux, - the company of Monsieur Lepage who worked on alluvial gold in the zone Mékambo – Makokou. Roux, Issezi and Lepage can be regarded as the founders of mining in the Minkébé region. In the Ndjolé region *La Société Duloz et frères* exploited gold deposits. Until this day one can still find artisanal miners in that zone, though they may have to leave if the Anglo Gold Ashanti exploration permit moves to be an active concession.

When the price of gold dropped in the early 1950's, due to the economic recovery of war wrecked Europe, most commercial French miners closed their operations while local artisanal mining continued.⁸⁵ Despite Gabon achieving its independence in 1960, France continued a firm grip on local politics and industrial mining companies from France still obtained permits. However, adventurer miners as those cited above soon faced increased regulation such as the first independent mining code from 1962.⁸⁶ What is more, previously, decree 00049/PM-MTP had, in 1959, already de facto made artisanal mining illegal for foreigners by stipulating per article 2 that only people living for over two years in the zone where they aim to mine can obtain a *carte d'expart*. In that same article, it was determined that artisanal miners could not be employed. Additionally, article 6 of this decree instructed that the totality of miners' production had to be sold to the state. De facto, this made quasi small mining units such as that of Roux and Lepage illegal as they either employed artisanal miners or bought gold from them, both of which had now become illegal.

3.3.3 SOGAREM

The new independent state stepped in to fill the void left by the pioneers as it created SOGAREM (*Société Gabonaise de Recherches et d'Exploitations Minières*) in 1960, under tutelage of Ministry of Economy, Planning and Mines, back then headed by Minister Nna Ekamkam.⁸⁷ More precisely, SOGAREM was a former private company turned parastatal whose prime aim was to create, on a not-for-profit basis, work for the over 3000 Gabonese artisanal miners.⁸⁸ These numbers were in no small part due to the Ndangui sites, which had opened in 1962 by local delvers producing large amounts of gold.⁸⁹ Indeed, in those early independence days, artisanal gold mining and SOGAREM seemed to gain strength, as:

⁸² Reports Mbaza, Koumi

⁸³ US Geological Survey Mineral Yearbook, International Volumes 1960-2011, chapters on Gabon, Nsomo

⁸⁴ Lahm

⁸⁵ Lahm

⁸⁶ Loi N° 15/62 du 2 Juin 1962 *portant l'institution d'un code minier en République Gabonaise*

⁸⁷ Lahm, and e-mail communication Claude Laroche, who was SOGAREM's director in 1965

⁸⁸ E-mails Laroche. Indeed, all further information on SOGAREM is from Mr Laroche, unless mentioned otherwise.

⁸⁹ USGS 1963

*"The SOGAREM position was strengthened additionally by the decree of November 16, 1963, when the Government declared the country closed to further exploitation of its alluvial gold resources by all persons except those of Gabonese origin who are working as registered artisans under the direct control of the company. This decree was issued mainly to prevent non-Gabonese possessing gold-mining concessions from hiring local villagers at low wages to do the work and then reaping substantial profits by selling the metal to the Government [...] Some of the artisans have found gold-mining quite lucrative, and individual monthly earnings as high as XAF100,000 have been reported."*⁹⁰

The first director of SOGAREM was laid off abruptly in 1965⁹¹ and was succeeded by Claude Laroche; a young French mining engineer who happened to be in Gabon to serve his social service in lieu of military service and accordingly stayed for only a year, despite having been offered a permanent position.⁹² Under the SOGAREM system, SOGAREM sold the miners a *Carte d'Expert*, therewith registering them. Miners could also buy the necessary tools (e.g. spade and pan) from them. The sites were indicated and marked by the French technicians who did the prospecting. Every last day of the month the technicians, who were based at fixed locations, bought the gold from the artisanal miners (powder and nuggets). In 1965, the price was set at 200 FXAF per gram, which equals 60 Euro Cents. Apparently, the price was sufficiently high to avoid competition from other buyers present, e.g. such as Lebanese and Haoussas. The gold was subsequently sent to SOGAREM's director general in Libreville in sealed crates by plane. The director general went to the airport to pick up the gold and bring it to the bureau where powder and nuggets were separated. Nuggets were sold off on the spot to whoever was interested, at 200 FXAF. The powder was sent to France to GIMOM (*groupement des industries minières outre-mer*), which refined the gold and paid SOGAREM a market related price. In return, each month, the director general sent the technicians the necessary cash. All this using the same crates and planes as roads into the interior of Gabon were all but absent in those days (and remain sparse today). Mr Laroche claimed a production of about one metric tonne a year during his stay at the helm of SOGAREM.

Lahm claims, without reference, that SOGAREM grew to quite a large entity, opening artisanal camps and establishing in situ food depots. Isolated camps were supplied with food and sundries by air when government gold buyers arrived. Little is known about the fate of SOGAREM; it ceased to exist, leaving no paper trail.⁹³ Indeed, unfortunately, no official documents on or of SOGAREM have been retrieved, even though the company had a monopoly on gold and diamond mining for decades. That said, diamonds were extracted neither in large quantities nor in good qualities. The US Geological Survey Mineral Yearbook mentions activity from SOGAREM in 1979 still. Yet, Mr Laroche, upon his brief return in 1980, claimed not to have found a trace of SOGAREM as it had been dissolved for quite some time already. It is well possible that Lahm confuses SOGAREM with the so-called "*période Gilbert*", an era allegedly from 1980 to 1989, in which activities as described by Lahm took place, indeed, or at least in Longo and Ndangui, run by a man called Gilbert.⁹⁴ Like with SOGAREM, no paper trail has been found of this period and Mr Gilbert has not been found thus remaining faceless and even without a first name. Once more it is remarkable to not find a paper trail, as Gilbert is said to have worked under the tutelage of the then Minister of Mines.⁹⁵ Strengthening this argument, SOFRECO, without source reference, puts the life-span of SOGAREM from 1962 to 1981 making it unlikely that the "*période Gilbert*" was operated by SOGAREM. As a matter of fact, none of the miners interviewed for this research and who had experienced the "*période Gilbert*" was familiar with SOGAREM or any other mining organisation from the state other than Mr. Gilbert.

3.3.4 DGRM

In 1972, the *Direction de la Géologique et Recherche Minière* (DGRM), was created.⁹⁶ Where possible, the DGRM was to aid miners, or groups of miners, in attaining semi-industrial levels of mining by improving prospecting techniques and use of tools aided by foreign geologists which DGRM brought on board. Such semi-industrial undertakings were obliged to involve over 50 per cent of Gabonese investments. In the North and North-East of Gabon, including in the surroundings of what is now Minkébé National Park, mining camps were established which exist to this day. Between 1980 and 1987, the budget of the Ministry of Mines to be spent on artisanal mining was 30 million XAF per year,

⁹⁰ USGS 1963. Decree mentioned could not be located unfortunately.

⁹¹ According to Laroche.

⁹² Little commerce is translated from French 'petit commerce'. It is however not unlikely that Laroche used the phrase not literally but deprecatingly, meaning SOGAREM's rather straightforward trading business was not his life ambition.

⁹³ SOFRECO

⁹⁴ Interviews with miners and notables in Ndangui and Longo.

⁹⁵ Interviews with miners and notables in Ndangui and Longo.

⁹⁶ On this note, SOFRECO's findings are at odds with Lahm's. Where Lahm seems to imply the BGRM to have taken over SOGAREM's activities, SOFRECO claims SOGAREM to have been active upto 1990. Lahm may have been right in that DGRM may at the time have been called BGRM, where the B stands for Bureau. Here it is chosen to label it DGRM if only to avoid confusion with the, in Gabon influential, state over BGRM geoscience & mining state owned consultancy firm

which at the time equalled roughly 91,500 Euros.⁹⁷ Despite these efforts and promising findings, DGRM could not convince foreign private parties to engage. This was likely due to the challenging tropical rainforest landscape, extraction cost and transportation difficulties due to the lack or even absence of relevant infrastructure.

Between 1985 and 1990, where DGRM was engaged, it took a census of the number of miners: 1,500 miners were counted. This seems little, as Ndangui and Longo alone are claimed by local miners to have had a head count of 1,000 miners or more in those days (see also the relevant sections on Ndangui and Longo). Besides Gabonese miners, DGRM found a large number of West African traders involved in illegal gold and other trafficking in the Minkébé areas. To curb traders' activities, DGRM, together with the local gendarmerie purged the Minkébé camp of illegal traders. DGRM then established a base camp at the shores of the Nouna River. The river currently largely defines the east boundary of the finger-shaped buffer-zone penetrating Minkébé National Park (see map in the section on Minkébé). The foreign traders aimed to circumvent such controls. Likewise, Gabonese miners sidestepped legal requirements by not selling their complete yield of gold in situ to the base camp agents. Indeed, miners were found selling gold in Makokou or even Libreville.⁹⁸ Additionally, state agents allegedly could not withstand the lure of gold profits.⁹⁹ The attempts to outwit DGRM controls, in combination with the unscrupulous behaviour of the agents, soon made the base station notorious.¹⁰⁰ With the Ebola outbreak in 1996, the camp was evicted. Underlining the antagonistic relations they had with the DGRM base camp officials, adjacent villagers who remained in the region took little time pillaging the base camp, taking everything usable.

In this same period, near Etéké, Ngounié province, government gold buyers were held at gunpoint. The pillage and the assault proved to be the end of the Ministry of Mines's involvement in organised gold buying activities.

3.3.5 SOGEMI

The year 1991 saw the arrival of a new entity, the *Société Gabonaise d'Entreprise Minière* (SOGEMI), financed with European aid from the SYSMIN program (see subsequent section for more on SYSMIN).¹⁰¹ SOGEMI's focus was on the development of two sites north of Ivindo National Park, aiming to reopen the old camps of Roux. However, SOGEMI's activities never took off in earnest and so the forest reclaimed the SOGEMI equipment left in the camps. After SOGEMI, no new initiatives have emerged from the Ministry of Mines. Hence, after the failure of SOGEMI and the withdrawal from the field of DRGM in 1996, Gabon's artisanal mining sector was basically left to its own devices from a national level perspective until a new SYSMIN project which started in 2005.

3.3.6 Service Assistance Technique (SAT) and SYSMIN

SYSMIN was a mining development programme of the European Union (EU) and its predecessor, the European Community. It is aimed to support and develop mining sectors in the former colonies of the EU called the African Caribbean Pacific (ACP) countries. The programme was established by one of the Lomé agreements between the EU and the ACP countries; that of 1980-1985.¹⁰²

"During that time, the Member States of the European Community were expressing concern at price fluctuations and the security of their supplies of minerals. To help to cope with the challenges facing the mining industry in the ACP countries, SYSMIN, an instrument designed for that industry, was established, and mining development was designated a priority for backing within the general programmes set out by the successive Lomé Conventions."¹⁰³

SYSMIN has since been discontinued by its European backers in favour of more holistic integrated approaches, linking mining development with larger EU development goals. SYSMIN was phased out after its 8th SYSMIN round of grants, of which Gabon was a recipient.¹⁰⁴ Hence, the Cotonou Agreement, which replaced the Lomé conventions when it entered in to force in 2003, no longer has a facility dedicated solely to the development of the mining industry.

⁹⁷ SOFRECO. The XAF was for a long time pegged at 50:1 to the French franc, until it was devalued to 100:1 in 1994. In 2002, per the introduction of the Euro, the 1 XAF equalled 0,00152449 euro CFAor at 656 XAF to the Euro.

⁹⁸ Personal communication between Hollestelle and Gustave Mbaza (WWF)

⁹⁹ Lahm

¹⁰⁰ Lahm

¹⁰¹ Without further details, SOFRECO refers to a short lived presence of a private organisation called SOGECORD from 90-91 where Lahm refers to SOGEMI in about the same period. Once more this paper chooses Lahm's findings over those of SOFRECO. That said, data is such sketchy that it cannot be excluded that both are right.

¹⁰² The Lomé agreements provided the legal basis for wide-ranging cooperation and provided such facilities as preferential trade arrangements for ACP goods and considerable technical and financial assistance. They were replaced by the Cotonou agreement in 2000.

¹⁰³ European Commission 1996

¹⁰⁴ Personal communication between Hollestelle and Gabon-based EU officials

Gabon entered the SYSMIN facility per the 1990-1995 tranche under Lomé IV. Most likely, Gabon's late arrival is explained by the fact that uranium and gold were only added to the list of SYSMIN minerals in Lomé IV.¹⁰⁵ SOGEMI, mentioned in the paragraph above, was one of the first tangible, though short lived, results of the first SYSMIN money flowing into Gabon. Also funded were the development of future radioactive waste storage facilities and the rehabilitation of closed uranium mining sites.¹⁰⁶ Mostly this involved cleaning toxic / radiation pollution resulting from the previous mining activities of Areva (the French parastatal uranium mining / nuclear power conglomerate). More relevant to the purposes of this report, SYSMIN funded a geological survey of Gabon resulting in detailed maps. Most relevant to this report, SYSMIN financed investment in the ASM gold sector aiming to:

1. Conduct a synopsis study of the sector
2. Organise seminars on artisanal extraction techniques
3. Re-organise the service in charge of technical assistance to the artisanal miners
4. Disseminate equipment¹⁰⁷

As mentioned in the third aim, a service exists within the structures of the Ministry of Mines which is officially concerned with ASM, the *Service Assistance Technique* (SAT; Technical Assistance Service). SAT falls under the *Direction Générale des Mines et Carrières* (DGMC; Directorate of Mines and Quarries) which in turn falls under the *Direction Générale des Mines et de la Géologie* (DGMG; General Directorate of Mines and Geology). For its field work, SAT should be able to fall back on the four subdivisions of the Ministry of Mines in Port Gentil, Lambarané, Makokou and Franceville. Yet, these outfits have been ranging from non-existent to being in significant disarray.¹⁰⁸ Only recently, the SAT chef has been transferred to head the Makokou office to strengthen the engagement of the MoM with the Minkébé ASM dossier. Hence, it is the SAT staff performing desk and field work. Next to the chef, Mr Bivegue who is a geologist by training, SAT consisted of an engineer and a technical officer.¹⁰⁹ Yet, as Mr Bivegue has not been replaced at the helm of SAT after his transfer to the Makokou field station, SAT for the moment is uncertain until decisions have been made regarding the future of ASM.¹¹⁰

It has not been established when SAT was created or when it started being involved with ASM. Even an interview with the current chief did not reveal such data.¹¹¹ If anything, following the reports on SYSMIN and the information shared by Mr. Bivegue and the miners in Ndangui, SAT had little impact or field presence until SYSMIN started supporting the unit.

Through SYSMIN, the unit was furnished with a double cabin four wheel drive truck, relevant soft- and hardware and a computer, prospection equipment (e.g. GPS) and camp gear for field missions. Furthermore, Mr Bivegue went on several missions to observe how ASM was regulated and executed in other African countries. SYSMIN and its consultants encouraged SAT to improve regulation and policy. Consequently, new policies and regulation have reportedly been drafted yet not gazetted or otherwise made public but for the decree on cooperatives.¹¹² Still, SAT was active, aided by consultants and SYSMIN funding, in buying and distributing to the miners new equipment, ranging from simple shovels and pans to motor-pumps. The tools were handed out to those miners who wanted to organise themselves into cooperatives. If not, miners could buy the tools.

The motor-pump was a new technique in most sites.¹¹³ Additionally, other new techniques and new types of sluices were introduced. The report refers to on site existing use of so-called 'Long Toms' which the project had hoped to make obsolete by introducing sluices.¹¹⁴ Only eight of these sluices were built and made available to miners. It was believed that the higher yield generated by the new sluices would entice miners to replace their Long Toms with the new model. Through on-site training on making and using the tools, it was believed the miners would adopt the new

¹⁰⁵ Personal communication between Hollestelle and Gabon-based EU officials

¹⁰⁶ European Commission 2000

¹⁰⁷ SOFRECO 2010

¹⁰⁸ SOFRECO 2010, confirmed by Bivegue and Mbaza; basically all units lack sufficient qualified staff and resources. The Makokou outfit was using a small office in the buildings of the local administration and did not have a car let alone a four wheel drive for field visits. By and large, other units were not better equipped.

¹⁰⁹ SOFRECO 2010, interview with Alain Bivegue, chef SAT September 2011

¹¹⁰ Anonymous source in the MoM

¹¹¹ Hollestelle interview with Bivegue

¹¹² Hollestelle interview with Bivegue and SOFRECO.

¹¹³ As far as the research could retrieve, it has been the SYSMIN project that has introduced the motor pump to ASM in Gabon.

¹¹⁴ The new sluice differed from the 'Long tom' on three points. They are wider at the end and they were furnished with a wire mesh and a mat. All three differences are aimed at increasing gold yield.

tools. However, a mission in 2010 by SAT and a SYSMIN consultant indicated that no adaptation has taken place.¹¹⁵ What is more, a miner in Mitzié who was furnished with the sluice did not use it as she found the sluice too heavy to transport it from one location to another.¹¹⁶

Next to the technical support, the SYSMIN project was to determine the parameters to establish ASM as an official industrial sector in Gabon. The SOFRECO 2010 report details the specific needs and chronology of a programme to establish such a sector.¹¹⁷ Given the realities on the ground, in this author's opinion the SYSMIN project cannot be considered a success; the government agencies working on ASM are still under-capacitated, gold production registration and collection is unsuccessful, distribution of *cartes d'expert* is weak both in terms of quality (e.g. registration) and in quantity (e.g. distribution), and miners still use outdated techniques causing much of the yield, particularly of fine gold particles, to be wasted. More importantly, for as far as could be established, no resources have been devoted to the realisation of the proposed plan to create an ASM industry.¹¹⁸

3.4 Regulatory context of ASM in Gabon

This section of the report examines ASM-relevant sections of the Mining Code currently in force, that of 2002.¹¹⁹ ASM is currently regulated by the Mining Code and by two additional texts. The current mining code makes obsolete the previous mining code; law 15/62 of 12 June 1962 and, accordingly, previous laws modifying the old mining code. The mining legislation, in its totality, consists of the following elements:¹²⁰

1. Law N° 5/2000 of 12 October 2000 pertaining the Mining Code in the Gabonese Republic, modified by
2. Law N° 7/2002 of 22 August 2002, pertaining the ratification of order N° 3/2002 of 26 February 2002,
3. Presidential Decree N° 1085/PR/MMEPRH fixing the conditions of application of law 5/2000, modified and completed by order N° 003/20021PR of 26 February 2002, ratified by law N° 7/2002 of 22 August 2002
4. Law N° 008/2005 of 30 March 2005 modifying Law N° 5/2000 of 12 October 2000

Modifications are promulgated by separate texts. Oddly, following the modification no new version of the Mining Code integrating the modification has been released.

The mining legislation distinguishes between two forms of extraction (Article 5, Mining Code) that of mining and that of quarries:

Mining regime	Quarry regime
<ul style="list-style-type: none"> – Primary goods for industry; – Primary goods for crafts – Energy sources 	<ul style="list-style-type: none"> – Building material – Material for public works – Alteration due to for cultivation of land

Table 1: Key differences in artisanal mining and artisanal quarrying regimes

Given the particular interest on ASM of gold, this section of the report will focus on the mining side of the legislation and not the quarry regime. Artisanal mining and small-scale mining are regulated by:¹²¹

- Section III "On artisanal and small-scale mining" of Chapter 2 of Title III of law 05, sections 102 to 109;
- Division III of Chapter 2 of Title III of Decree No. 1085/MMEPHR, sections 118 to 147.

The Mining Code's Article 2 also assembles dispositions of relevant other laws and regulations. In light of this report's emphasis on environment, the most important is the referencing of Law n°16/93 of 26 August 1993, relating to the protection and the amelioration of the natural environment, also known as the Environmental Code. The Mining Code does not directly refer to national parks or other protected areas. Still, in many chapters of the Mining Code, and for

¹¹⁵ SOFRECO 2010

¹¹⁶ SOFRECO 2010

¹¹⁷ What is more, on the legislative and institutional level, the report has already takes stock of some essential such as the experience with microfinance and cooperatives in Gabon. The only weakness of the plan is that it is not based on a socio-economic cultural / environmental study. To its credit, the report admits that much and warns that little to nothing can be done without the information such studies would bring about.

¹¹⁸ Since no evaluation report of the ASM SYSMIN project in Gabon could be retrieved despite several efforts by the author, it is unclear how the EU and Gabon appreciate the results of the project. What is more, it could not be established, through contacts with different members of the local EU representation, whether or not an independent evaluation has been executed.

¹¹⁹ While a new Mining Code is being developed and several drafts have been circulated, its contents are not covered in this report as versions of the code differ too widely and there is not yet a single vision of ASM.

¹²⁰ Translations of laws and other regulations are not official but rather conducted by the author (Hollestelle).

¹²¹ Hence this excludes regulation pertaining to artisanal exploitation of quarries.

all phases of mining, there is reference to a requirement to respect “*obligations relative to the protection of the environment ... or relative to the preservation of the forestry patrimony and the hydraulic resources.*”¹²² Presumably the reference to forestry patrimony includes legal arrangements including the law on the national parks which was drafted seven years after the Mining Code, in 2007. This view is strengthened further by article 124 of the Mining code which reads:

“When the general interest demands so, a decree of the President of the Republic, taken per proposition of the Ministry of Mines, can forbid exploration or exploitation works within the zones therein mentioned.”

That said, while the law on the national parks was promulgated by presidential decree, the law pertaining to activities in the buffer zone of parks is ‘only’ a ministerial bye-law.¹²³ However, while it references the Forestry Code, the ministerial directive neither makes reference to the Mining Code nor to the Environmental Code. Ultimately, such details of reference and laws outranking one another may become subject to juridical disputes. However, it is hoped that this lack of clarity will be resolved through the Gabonese government’s sectoral guide for mining and the environment, which is currently under production by both the ministry of mines and the ministry of environment.

Additional regulations that are relevant to ASM are:

1. Ministerial directive n°001080/MMEPRH/SG/DGMG/DMC/SCTMC of 29 October 2007 setting the conditions for the creation and the functioning of artisanal mining cooperatives in Gabon
2. Presidential decree n°1018/PR/MMPH of 24 August 2011 pertaining to the creation, attributions and organisation of the Equatorial Mining Company
3. Ministerial directive n°000118/PR/MEFEPEPN of 1 March 2004, pertaining to the regulation of forestry mining, agricultural, aquacultural, hunting and touristic activities in a buffer zone

The Gabonese legal context differentiates between artisanal mining and small-scale mining, as described below.

3.4.1 Artisanal mining

The Mining Code defines artisanal mining (section 102, law 05/2000) as a method of operating with little or no mechanised aid, where “*the driving force of water obtained on site and not transferred into hydroelectricity or a motor pump*” are not to be viewed as mechanised. Thus phrased, artisanal mining is defined by what it is not: it is non-mechanised. As such, the definition fails to include elements of organisation, tonnes processed etc. (see the section below for further details and elaboration). Artisanal mining is restricted to Gabonese Nationals only. Also, artisanal mining rights are “*exclusively reserved for rural populations working under tutelage and the control of the competent divisions of the administration in charge of mining.*”¹²⁴

Permission to engage in artisanal mining is granted by the Ministry of Mines in the form of a card for artisanal exploitation, the *Carte d'Exploitation Artisanale*, or in short, the *Carte d'Expert*. Table 2 displays the characteristics of the *Carte d'Expert*. The card is a personal, non-transferable permit subject to payment of an annual fee (article 103, Mining Code). A *Carte d'Expert* holder does not need additional authorisation for possession, transportation, preparation, processing, and marketing of precious substances (stones and precious metals). In practice, this means that officially artisanal miners can transport their yields between their mining site, their house, and the nearest government recognised buying bureau, which is either an accredited commercial party or a local chapter of the Ministry of Mines.¹²⁵ The list of such bureaus or agencies should be established by a joint directive of the Minister of Mines and the Minister of Finance. If there is no organisation, the administration in charge of Mines can temporarily ensure missions of the MoM to buy and collect gold (article 104, Mining Code and article 124, decree 1085). It is unclear for how long such an arrangement is allowed; the temporary arrangement has been in place by default for over two decades now in the absence of appointed buyers. Organisations accredited to participate in buying of artisanally extracted precious substances need to note each purchase on a collection sheet (Article 125, decree 1085) and also note the quantities sold and the date of sale on the *Cartes d'Expert*. Hence, in absence of an accredited buyer miners can stockpile their yield and wait for a field mission of the Ministry of Mines to visit.¹²⁶ If miners were to adhere to this, and given that the Ministry of Mines’ visits are sparse, it would create a dire security situation for the

¹²² E.g. Article 94 of the Mining Code.

¹²³ Arrêté n°000118/PR/MEFEPEPN du 1 mars 2004, portant réglementation des activités forestières, minières, agricoles, aquacoles, cynégétiques et touristiques à l'intérieur d'une zone tampon.

¹²⁴ Article 118, decree 1085

¹²⁵ All this de jure, i.e. in accordance with mining regulations which does not necessarily mean de facto as regulations have not been fully implemented. Still, this section examines only legal texts, not implementation thereof.

¹²⁶ If they do so, in accordance with article 150 of decree 1085, they have to keep a log of their stock. This log needs to be showed and validated by passing field mission of the ministry of Mines.

miners. All buying and selling of gold is to be at a price fixed by ministerial directive (article 126, decree 1085, set per decree 1222). In June 2012 the price was set at 16500 XAF while the in situ buyers paid 22000 XAF. Suffice to say that this does not entice miners to stock their yields and wait for the Ministry of Mines to buy their gold. Set prices do not exist for diamonds; these are evaluated per transaction.

The Ministry of Mines can support small-scale operators to improve existing technologies or to introduce new techniques with regards to artisanal mining. This can either be free services or this can be against payment, e.g. for the supply of materials necessary for their activity (article 105, Mining Code).

Characteristics of a <i>Carte d'Expert</i>	
- Applicant	- Gabonese national - Free of any commitment to any, either public or private, employer (article 120, decree 1085)
- Duration of validity	1 year, renewable limitlessly (article 120, Mining Code)
- Rates	- 5.000 XAF for the institution of the <i>Carte d'Expert</i> - 10.000 XAF for each renewal of the <i>Carte d'Expert</i> (Article 160 bis 4, law 008/2005)
- Geographic Validity	- Right to exploit in regions, basins or rivers as indicated on the individual <i>Carte d'Expert</i> . - Laissez-passer solely for transport of precious extracted substances from production site to the domicile of the artisanal miner and from that place to the registration centre or to the buying office (article 123, decree 1085).
- Substances	Right to exploit precious substances as indicated on the individual <i>Carte d'Expert</i> .
- Obligations	Vending of all substances to an appointed body. Amounts sold will be recorded by the organism. If a miner has not sold to the designated body for twelve months, the Ministry of Mines may refuse renewal of the <i>Carte d'Expert</i> .

Table 2: Artisanal mining permit attributes

Legal artisanal miners are not bound by environmental or health regulations. The only mentioning of health in decree 1085 is in article 216 where it is mentioned that the Ministry of Mines needs to inform relevant local authorities of concentrations of human beings in artisanal mining camps; this to prevent epidemics, e.g. of Cholera, AIDS or Ebola.

Cardholders of *Carte d'Expert* can organise themselves into cooperatives as mentioned in article 122 of the Mining Code. Directive No. 1080/MMEPRH/SG/DGMG/DMC of 29 October 2007, sets the conditions for the creation and operation of artisanal mining cooperatives of Gabon. The organisation of a general assembly is required, local authorities must be notified at least 15 days in advance and the cooperative must have at least 10 founding members. The application package must include:

- An application for recognition addressed to the Minister of Mines
- A copy of the minutes of the General Assembly constituent
- The statutes and the rules of procedures adopted by the General Assembly and constitutive body which are to be provided to the Administration in charge of mining
- List of founding members with the numbers of their *Carte d'Expert*
- The composition of the Management Committee elected;
- A program of activity for the first year;
- A map at a scale of 1:50 000 showing sectors for the first year.

Decree 1080 does not mention tax or other business regulations cooperatives may be subject to, e.g. registration with the chamber of commerce, health and safety regulations etc. Not only is this remarkable, it is in contrast with other existing and comparable Gabonese legislation, e.g. the Agricultural Code which stipulates that agricultural cooperatives are exempt from certain taxes.¹²⁷ Equally salient is the absence of references to other legislation with regards to cooperatives, nor does it refer to the Ministry of Small and Medium Enterprises, Artisans, and Commerce (*Ministère des Petites et Moyennes Entreprises, de l'Artisanat et du Commerce*). In all, artisanal mining cooperatives seem to be in a legislation void. On the note on absent notions, neither the code nor the decree mentions any environmental obligation with respect to the practice of artisanal mining.

¹²⁷ Loi n° 022/2008 Portant Code Agricole en République Gabonaise.

Finally, and underscoring the need for precise definitions, the government can close down a zone open for artisanal mining when it considers the means of exploitation no longer in line with what is deemed artisanal (article 129, decree 1085). From the closure notice, artisanal miners then have two months to organise themselves as a small-scale mining operation and apply in accordance with relevant regulations (Article 130, Decree) as described in the following paragraph.

3.4.2 Small-scale mining (SSM)

Article 107 of law 05/2000 defines small-scale mining as

“All mining exploitation characterised by:

- A staffing of seventy (70) employees or more, all categories included;*
- A production of a maximum of hundred thousand tonnes of minerals run of mine;*
- Economically exploitable mineral reserves evaluated at no more than two million tonnes;*
- An investment not exceeding one billion XAF;*
- A turnover not exceeding two billion XAF.”*

While this definition of small-scale mining is significantly more precise than that of artisanal mining, there remains an apparent grey zone for mining that is staffing less than seventy people. The legal grey zone is partially caused by it not being entirely clear whether the criteria need to all be applicable for it to be considered small-scale mining or not. The large pits at the Minkébé ASM camps, discussed later in this report, were essentially small-scale mines as they had a turnover over more than two billion XAF (three million euros) since they produced over 100 kilos of gold at a gold price of 30 euros per gram. Noticeably, as stated previously in the section on artisanal mining, the legal grey zone exists *because* artisanal mining is defined less precisely.

In article 140, Presidential Decree N° 1085/PR/MMEPRH, with reference to article 107 of law 05/2000 defines small-scale mining as a means of exploitation which: “... uses methods, means and infrastructure lower than the big mining and aims to ensure a more rational and better exploitation of the deposit than does artisanal mining.” While the intention here is perhaps a capacitated, removed, engineering interpretation of ‘rational’, for the artisanal miners themselves their motivations, too, are socially and economically rational in that they maximise their profits with the means available to them in the light of their reasons for mining, e.g. earning money for schooling fees. It does not get more rational than that.

Characteristics of a Small-Scale Mine	
Mining title	Small-scale Mine exploitation permit, handed out per decree, (article 140, decree 1085), on the condition that it was preceded by a, well managed research permit, (article 53, decree 1085)
Permit application	Subject to the same regime as other mining exploitation permits (article 109, Mining Code/ article 141, decree 1085), as laid down in article 71 and 72 of the Mining Code. Said articles stipulate that SSM permit applications need to include a plan to bring into exploitation and a plan to develop of the deposit. In turn these plans need to include: <ul style="list-style-type: none"> - Information on the quantity of the exploitable reserves, progression of development and the impact of the exploitation on the environment; - A summary of the feasibility study, including a projection of the fiscal pressure as stipulated in article 191 of the Mining Code.
Validity	Permits are granted by Presidential decree, per suggestion of the Ministry of Mines, subject to a public inquiry, for an initial period of five years after which SM permits are renewable by three years as often as deemed necessary (article 77, Mining Code / article 140, decree). Remarkably, on validation of the permit, article 77 mentions the permit is to be subject to an approved impact study on local populations. This is not mentioned in the articles pertaining to application requirements.
Alterations to the permit (e.g. new partners, extension, etc.)	Subject to the same regime as other mining exploitation permits (article 109, Mining Code / article 142, decree 1085, referring amongst others to Title III, chapter II of the Mining Code).
Taxes	Subject to the same regime as other mining exploitation permits (article 109, Mining Code / article 143, 144, decree 1085, referring mostly to Article 159 – 198 of the mining code). The most prescient aspect is that a small-scale mining outfit would need an adequately equipped admin office far beyond the standard capacity of artisanal miners even when gathered in a coop.
Surface	Less than 1 km ² (article 147, decree 1085)
Staffing	Less than 70 persons (article 107, Mining Code)
Production	≤ 100 000 tonnes (idem)
Proven reserves	≤ 2 million tonnes (idem)
Investment	≤ 1 billion FXAF (idem), of which ≥ 15 per cent (idem) needs to be FXAF
Turnover	≤ 2 billion FXAF (idem)

Table 3: Legal definition of a small-scale mine

	Fixed rate	Rate relative to size
Creation	2.500.000 XAF	50.000 XAF/km ² /an
Renewal	3.500.000 XAF	
Permit alterations	5.000.000 XAF	Ø

Table 4: Rates concerning small-scale mining

Tables 3 and 4 summarise the characteristics and taxation in force for small-scale mines.¹²⁸ Comparing Table 3 with the requirements for artisanal mining it becomes apparent that a small-scale mine is distinct from artisanal mining not just in terms of mining techniques but also based on projected turn-over, invested capital and staffing. This is underlined by the fees related to the creation of small-scale mines (2.5 million XAF) when compared to obtaining a *Carte d'Expert* (5.000 XAF). On the notion of fees, noticeably, like with a *Carte d'Expert*, it is cheaper to start a mine with a permit for five years, than it is to renew the permit for three years as seen in Tables 3 and 4.

¹²⁸ Rates and fees as in Table 6 are as depicted in law 008/2005, article 160, Bis 4.

3.4.3 Legal relationships between artisanal mining, small-scale mining, and large-scale mining

In sum, a small-scale mine is a business entity whereas artisanal mining in Gabon, even if all regulation is fully implemented, is one step above informal employment. Indeed, artisanal miners gain little with the purchase of a *Carte d'Expert*. If anything it puts them on the radar of the government when they are already in a weak negotiating position, even if they are legal. Technically the government requires artisanal miners to sell mined gold at fixed prices that may be uncompetitive with other rates available, and the miners can only weakly contest the opening or closure of a zone to artisanal mining. Ultimately, artisanal miners are at the bottom of the mining hierarchy when compared to small-scale and large-scale mines (LSM) as permits for these outrank artisanal mining rights, *Carte d'Expert* or no *Carte d'Expert* (SSM prerogative article 146, decree 1085, LSM prerogative articles 131/132, and decree 1085). The only mentioning of compensation is with regards to small-scale mining's prerogative over artisanal miners as article 146 of decree 1085 stipulates that, where the coming into existence of a small-scale mine necessitates an end of artisanal activities, a small-scale mining entity must prioritise the hiring of those artisanal miners who hold a valid *Carte d'Expert*. No comparable obligation is mentioned for LSM entities when finding artisanal miners on their site whose activities need ceasing.

3.5 Biodiversity and conservation in Gabon

No matter how detrimental it has been for the diversification of the economy, in terms of the environment, Dutch Disease has proven to be a blessing for maintaining forest cover and biodiversity:

*"Dutch Disease implies declining competitiveness and structural change across sectors, normally triggering 'deindustrialisation' in developed countries and 'de-agriculturalisation' in developing countries. Yet, this de-agriculturalisation also tends to significantly reduce pressures to convert land for agricultural uses, which globally is the principal direct cause of deforestation."*¹²⁹



Figure 10: Global Ecoregions in Gabon¹³⁰

brought attention from global conservation organizations, and it has been dubbed the 'Green Heart of Africa'. Indeed, Gabon is home to five of the world's 200 Global eco-regions, which together cover the entirety of Gabon (see Figure 10):

- Atlantic Equatorial coastal forest (AT0102)
- Central African mangroves (AT1401)
- Cross-Sanaga-Bioko coastal forests (AT0107)
- Northeastern Congolian lowland forests (AT0126)
- Western Congolian forest-savanna mosaic (AT0723)

Given its importance, WWF considers the whole country a conservation priority.

In this section the report highlights relevant legislation determining and defining the different types of protected areas in Gabon. The forestry regulation is recapitulated to some degree of detail to explain the importance the Gabonese management requirements for forestry concessions hold for conservation of sensitive ecosystems. Due to the lack of population pressure and the relatively pristine condition of Gabonese ecosystems, next to the ANPN and

¹²⁹ Wunder, p2.

¹³⁰ Encyclopaedia of the Earth (a)

the conservation organisations, forestry companies are, theoretically, important players in safeguarding Gabon's unique ecosystems.

3.5.1 National hunting regulation

Through its Forestry Code (FC), Gabon has severely restricted hunting.¹³¹ For 27 species, hunting, capturing, detention, commercialisation and / or transport is forbidden in accordance with FC article 245. The species are depicted in Figure 11, a poster created for awareness raising purposes, produced by conservation organisations in Gabon such as WWF-Gabon. Additionally, hunting is subject to a regime involving permits which are only to be issued to people who also carry a permit to carry a weapon. Only a limited calibre is permitted to be used for hunting (FC Article 175), basically reducing hunting rifles for everyday people to buckshot rifles, calibre .12. Besides further limiting hunting to a hunting season from the 15th of March up to the 15th of September, several hunting methods such as hunting with nets and poison are prohibited. The latter has a larger environmental effect in that poisoning of waterways is mentioned. Most of all, hunting is forbidden in integral nature reserves, sanctuaries, national parks and wildlife reserves. These four plus variants of protected areas cover roughly 13 per cent of Gabon's territory.



Figure 11: Images of the 27 protected species in Gabon, for which it is illegal to hunt, capture, detain, or transport, in accordance with article 245 of the Forestry Code.

¹³¹ Loi n°16/01 du 31 décembre 2001 portant code forestier en république gabonaise

3.5.2 Types of protected areas in Gabon

Gabon has known protected areas since the 1930's onwards.¹³² Since then protected areas have been subject to different regimes that are summarized in Table 4. The specific regulations can be found in the 2001 forestry code and in the 2007 law regulating national parks.¹³³

Type of protected area	Definition
Integral Nature Reserve	Area within which the activities likely to disturb the flora or fauna is prohibited, as is the introduction of animal or plant species native or exotic, wild or domestic
Zoological Garden	Area or public or private institution characterised by the exhibition of live animals or rare species for recreational, aesthetic, cultural ends or for restocking purposes
Animal & Plant Species' Sanctuaries	Protection area for specific or endangered animal or plant communities and their habitat
Wildlife Reserves	Protected area for conservation of biodiversity, the spread of wildlife and the management of its habitat
National Parks	A protected area vested on a portion of the territory or of terrestrial or marine ecosystems, geomorphological sites, historical and other types of landscapes which enjoy a special protection with the objective to manage the biological diversity and processes of regulating the natural ecology and to allow regulated ecotourism, scientific and educational activities all the while contributing to the economic and social development of local communities
Hunting Domains	Zone where hunting is subject to a more restrictive regime, particularly concerning culling numbers
Biosphere Domains	Protected area aiming to conserve the diversity and integrity of animal and plant communities within natural ecosystems
World Heritage Site	Protected area aiming to protect unique natural and cultural elements

Table 4: Types of protected areas in Gabon¹³⁴

Though logging is not permitted in protected areas (Art. 70, 2001 Forestry Code), the rules on mining in protected areas other than national parks (discussed below) are not clearly stated.¹³⁵ For reference on this point one could take guidance from the Environmental Code which states:

*"To protect areas (protected) and to safeguard the integrity, it is prohibited to undertake activities that can lead to degradation or to change the original appearance of the landscape, the structure of the fauna and flora, or the ecological balance unless special permission of the competent statutory body is obtained."*¹³⁶

Besides the national protection statuses, three international protected statuses are represented in Gabon. The biosphere reserve and UNESCO World Heritage sites recognised in Gabon are:

- Biosphere reserve Ipassa Makokou was classified as such in 1983 by UNSECO under the Man and Biosphere programme (MAB) The MAB Programme is an intergovernmental scientific programme aiming to set a scientific basis for the improvement of the relationships between people and their environment globally. The reserve is now linked to the National Park Ivindo at its northern border
- In 2007, Lopé was recognised as a World Heritage Site by UNESCO, strengthening the protected status it already enjoyed in being a National Park.

¹³² Evao Conseil, 2009

¹³³ Loi n°16/01 du 31 décembre 2001 portant code forestier en république gabonaise

¹³⁴ All from the Forestry Code as in Evao Conseil 2009 p.54, but for the national parks which is taken from the 2007 law on national parks. Translation by lead author.

¹³⁵ Article 70 (nouveau) Ordonnance n°11/2008 du 25 juillet 2008 modifiant et complétant certaines dispositions de la loi n°16/2001 du 31 décembre 2001 portant code forestier en République gabonaise, in Evao conseil

¹³⁶ "Article 29, Loi N° 16/01/93, relative à la protection et à l'amélioration de l'environnement, in Evao Conseil ; translated by lead author (Hollestelle).

The third international status concerns the so-called Ramsar Sites, wetlands of international importance. Gabon did ratify the Ramsar Convention in 1987, yet it has so far not recognised related protected areas in national law. On its website, the Ramsar Secretariat currently lists nine Ramsar Sites in Gabon:¹³⁷

- Wonga - Wonghue
- Petit Loango
- Setté Cama
- Parc National Akanda
- Parc National Pongara
- Monts Birougou
- Bas Ogooue
- Chutes et Rapides sur Ivindo
- Rapides de Mboundou Badouma et de Doume

Type of protected area	Name of protected area	Type of protected area	Name of protected area
Integral Nature Reserve	- Wonga Wongue	National Parks	1. Akanda
Zoological Garden	- Port Gentil Zoo		2. Birougou
Animal & Plant Species' Sanctuaries	- Iboudji		3. Batéké
Wildlife Reserves	- Ouanga		4. Ivindo
Hunting Domains	1. Iguela 2. Ngove-Ndongo 3. Setté Cama		5. Loango
Biosphere Domains	- Ipassa Makokou		6. Lopé
World Heritage Site	- Lopé National Park		7. Minkébé
		8. Mwangé	
		9. Monts des Cristal	
		10. Moukalaba Doudou	
		11. Pongara	
		12. Waka	

Table 5: List of official protected areas in Gabon by type¹³⁸

Some of these sites overlap existing national parks (Akanda, Pongara, Monts Birougou) while again others overlap with other protected areas (Presidential Reserve Wonga Wongue, Wildlife reserve Petite Loango, Hunting domain Setté Cama). The remaining three (Bas Ogooue, Chutes et Rapides sur Ivindo, Rapides de Mboundou Badouma et de Doume) are not covered by existing protected areas. While the Ramsar sites show maps of the said sites, these maps are rough in that they do not outline the exact coordinates of the site borders. Efforts are currently being developed by conservation authorities to define borders, and develop a management system for RAMSAR sites in Gabon.

Thus several types of protected areas, as listed in Tables 4 and 5 are recognised in Gabon, of which all but the Ramsar sites are officially put under a strict regime to protect wilds, vegetation, a combination of the two, or even complete ecosystems as we shall see in the following sub-paragraph on National Parks.

3.5.3 National parks

Cognisant of the value of Gabon's ecosystems, the defunct president Omar Bongo Ondimba, at the 2002 Sustainability Summit in Johannesburg, South Africa, declared the foundation of a network of national parks. Following the sweeping statement, officially all was arranged one decree per national park 30th of August 2002.¹³⁹ According to the law regulating the parks, the creation of the national parks intends:

"...in the light of the process of the development of conservation of the national natural and cultural patrimony, to promote a policy of protection and sustainable utilisation of the national parks, in particular by the creation of a network of parks representative of the biological biodiversity of Gabon and which covers at least ten per cent of the national territory..."¹⁴⁰

¹³⁷ http://www.ramsar.org/cda/en/ramsar-pubs-annolist-anno-gabon/main/ramsar/1-30-168%5E16397_4000_0_

¹³⁸ Evao Conseil 2009

¹³⁹ Décrets n°607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618 et 619/PR/MEFEPEPN

¹⁴⁰ Loi n°003/2007 du 27 août 2007 relative aux parcs nationaux, translation by lead author (Hollestelle) with emphasis added.

More specifically, a national park serves the following aims:

- “the reproduction, the protection, the conservation of wild species of animals and plants;
- the management of their habitat;
- the protection of sites, landscapes or geological formations of a particular scientific or aesthetic value in the interest and for the recreation of the public;
- develop touristic activities.”¹⁴¹

The government’s actions on conservation currently exceed the law. Interestingly, the law mentions the minimum of ten per cent of the national territory; currently, the national parks cover roughly 11 percent. The law also allows for park borders to be changed in the short term, provided that the change does not cause more than a two per cent change in total surface and until five years after being promulgated to law, meaning until August 31st, 2012. After 31st August 2012, national parks borders can only be altered when compensated by a comparable piece of territory. Comparable then, needs to be understood in terms of quantity *and* in terms of quality. A change of borders could be caused by a desire for mining as exploration is allowed in national parks, albeit after being approved by the relevant agencies and the council of ministers.

With regards to ASM, the definition of what constitutes a national park is noteworthy (see Table 4):

*“A protected area vested on a portion of the territory or of terrestrial or marine ecosystems, geomorphological sites, historical and other types of landscapes which enjoy a special protection with the objective to manage the biological diversity and processes of regulating the natural ecology and to allow regulated ecotourism, scientific and educational activities **all the while contributing to the economic and social development of local communities.**”*

In addition to the definition specifically mentioning contributing to economic value to local communities, the language does not mention villages but communities. Perhaps not intentionally, this phrasing may open up the door for ASM communities like those around Minkébé National Park who were present before the creation of Minkébé National Park. According to the law, the development of these communities should be laid down in a management plan of the ‘*zone périphérique*’ (peripheral zone) which includes the ‘*zone tampon*’ (buffer zone).¹⁴² While the buffer zone is defined as a zone of five kilometres outwards from the park borders, the borders of the peripheral zone and its use have to be defined by the park management in close cooperation with the communities living in the zones.¹⁴³ So far, none of the national parks currently have a management plans for the peripheral zones.¹⁴⁴ Nonetheless, strikingly, the regulation explicitly mentions ASM as being allowed within the buffer zones of national parks.¹⁴⁵

The lack of management plans may partially be explained by the fact that the relevant authority to draft the plans was not created by law until January 2008.¹⁴⁶ This agency, the ANPN, is in charge of running the national parks per the 2007 law regulating the national parks. Within its remit is for it to take responsibility for the national parks by “*taking into account the equilibrium and the stability of the ecosystems*”¹⁴⁷ And with putting “*into place the means and procedures for the protection of the natural habitats and of the wildlife in particular rare and endangered species of flora and fauna, in situ and ex situ*”.¹⁴⁸ Combining the responsibility for the equilibrium and the ex situ mandate, the ANPN has a wide area to cover indeed. It makes the ANPN all the more central as a stakeholder in containing the impact of ASM in and around protected areas and sensitive eco-systems in Gabon, particularly as it is the ANPN who needs to draft, with existing communities, the management plan of the peripheral zone. Particularly with an eye on ASM, it will prove interesting to see how the ANPN, which is in essence geared towards conservation, handles the social, cultural and economic development requirements of communities in the peripheral zone.

3.5.4 Forestry concessions and sustainable forestry management

Protected areas in Gabon are part of forestry management. Article 20 of the Forestry Code states that all types of forests, whether categorised or not, are to be subject to a management plan. Such a plan should integrate the following objectives:

¹⁴¹ Code Forestier 2001, Article 76

¹⁴² Loi n°003/2007 du 27 août 2007 relative aux parcs nationaux, article 13-16.

¹⁴³ Idem, Arrêté n°000118/PR/MEFEPEPN du 1 mars 2004, portant réglementation des activités forestières, minières, agricoles, aquacoles, cynégétiques et touristiques à l’intérieur d’une zone tampon, article 2.

¹⁴⁴ Personal communication with relevant conservation professionals in Gabon

¹⁴⁵ Arrêté n°000118/PR/MEFEPEPN du 1 mars 2004, Article 2.

¹⁴⁶ Décret n°00019/PR/MEF du 9 janvier 2008, fixant les statuts de l’Agence Nationale des Parcs Nationaux

¹⁴⁷ Décret n°00019/PR/MEF du 9 janvier 2008, fixant les statuts de l’Agence Nationale des Parcs Nationaux ; , translation by lead author.

¹⁴⁸ Décret n°00019/PR/MEF du 9 janvier 2008, fixant les statuts de l’Agence Nationale des Parcs Nationaux ; , translation by lead author.

- Effective implication of nationals in the activities of the Water & Forests sector
- Protection of eco-systems and conservation of biodiversity
- Adding value to resources and eco-systems
- Regularity and sustainability of production
- Management of natural resources
- On-going inventory of resources
- Tuition –and research
- Awareness raising & communication, information and education of users and of local populations

All of the above are to be done with respect for the customary user rights of contiguous populations. These objectives plainly demonstrate the integral nature of forestry management in Gabon, be they National Parks or forestry concessions. Further clarifying the regulatory links between the different types of forest use, Figure 12 (below) depicts the rules for forest use by type of protected area.¹⁴⁹ It should be well noted that, in line with article 148 of the Forestry Code, none of the forestry permits allows the permit holder to exploit non-timber forest products. Exploitation thereof is subject to separate regulation laid down in decree 1029/PR/MEFEPEPN of December 1, 2004. The four existing tangible types of use and related permits are depicted by the hatched green ovals on the right, bottom side of the chart. Auxiliary testimony of the integrated approach and the subsequent interconnectedness of forestry concessions and National Parks is the explicit reference to touristic value of fauna in forests made by the *Technical National Guide for the Exploitation and Management of Forestry Domains*.

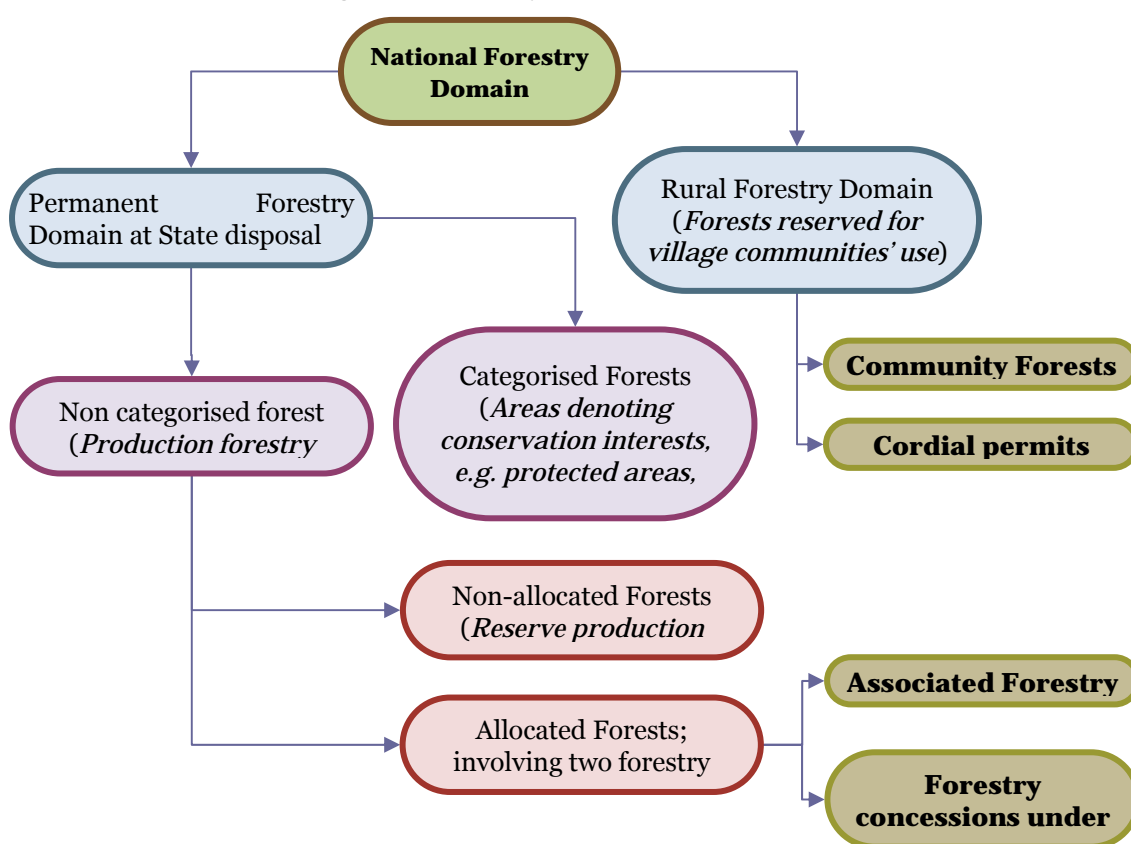


Figure 12: Forest classifications, use and permits in Gabon

In sum, following from the above, though not listed as protected areas de jure, de facto forestry concessions can be regarded as ‘protected areas like’ given that all of these areas need to be under sustainable management, as stipulated in detail in by decree 0689/PR/MEFEPEPN, December 1, 2004.¹⁵⁰ Annex B of this report details the requirements to come to a contract with the government for sustainable forestry management, a *Convenant Forestière Aménagement Durable* (CFAD).

¹⁴⁹ Translation by lead author of first figure in *Le Guide Technique National pour l'aménagement et la gestion des forêts Domaniales*, as published by the Gabonese Ministry of Water & Forests

¹⁵⁰ Décret Présidentiel 0689/PR/MEFEPEPN, Décembre 1, 2004, Définissant les normes techniques d'aménagement et de gestion durable des forêts domaniales productives enregistrées

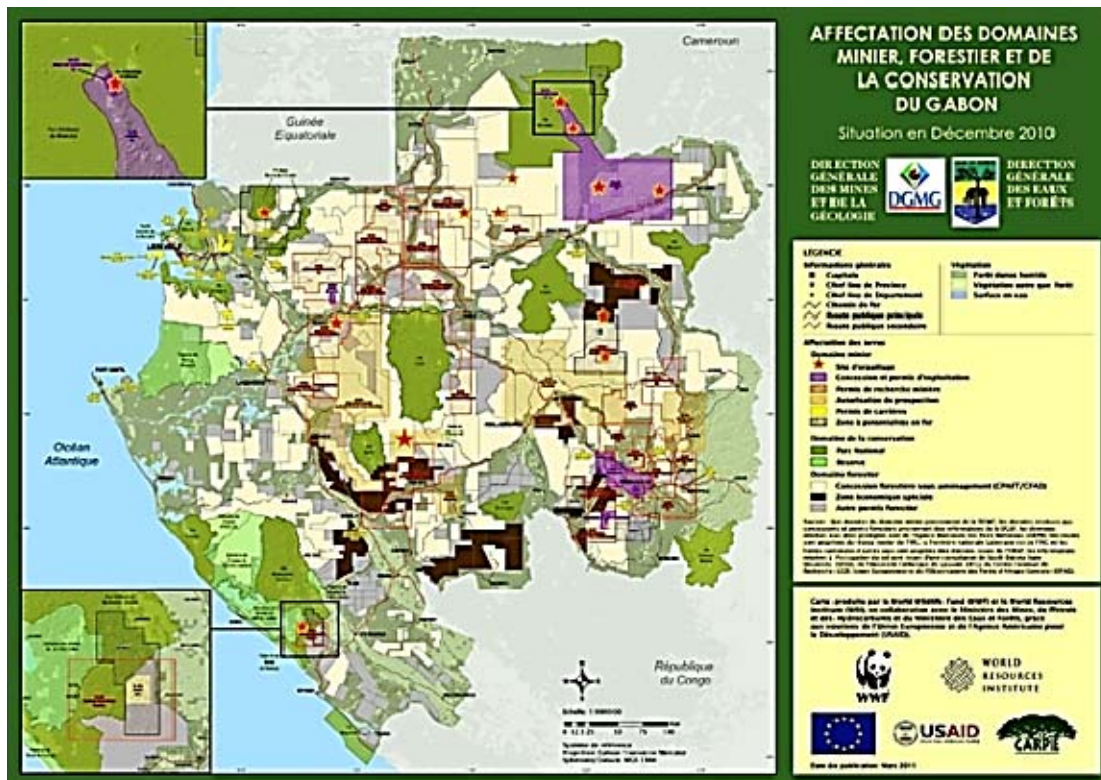


Figure 13: Land Use and ASM in Gabon

In addition to detailed rules protecting flora and fauna,¹⁵¹ by law, local communities and their habitual or traditional use of the forest are to be both be respected and controlled. The decree prescribes that participative mapping exercises and other consultations with the local communities be done before the commencement of exploitation to benchmark what is to be used to map their use of the forest including both timber and non-timber products. All this of course within the realm of the restrictive hunting laws of Gabon. So while the villagers gain a right to farm alongside, some, forestry roads, by no means are they granted liberal use of the forestry roads. This to show how the villagers can gain from the economic development while the forestry company needs to, with support from monitoring missions from the Ministry of Water & Forest, prevent abuse of forest resources by local communities and third parties alike. Note that such user rights within a forestry concession can only be obtained by settlements which have administrative stature of a village.

Longo and Ndangui are located within forestry concessions (see Figure 14). Minkébé is not situated in a forestry concession, but rather in the buffer zone of the Minkébé National Park. Given the stringent conservation regulations forestry concessions have to adhere to in Gabon and the fact that these forestry concessions are in fact part of the WWF Global 200 priority Ecoregions, plus the fact that most ASM takes place in forestry concessions, it is vital to include these concessions in studies on the impact of ASM on sensitive eco-systems in Gabon.

¹⁵¹ See, for example, *Le Guide Technique National pour l'aménagement et la gestion des forêts Domaniale*

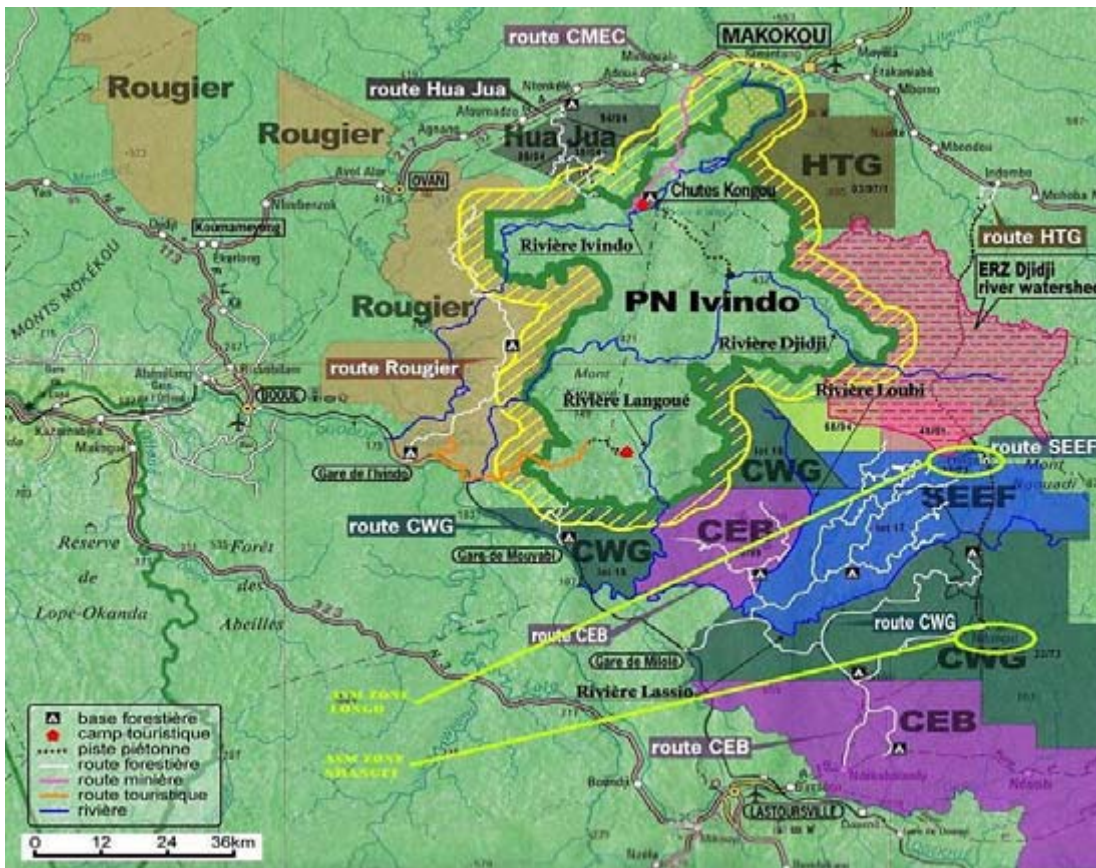


Figure 14: Ndangui and Longo in Forestry concessions

3.5.5 Overlap of ASM in PACE locations in Gabon

According to some estimates, there are between 5,000 and 10,000 artisanal and small-scale miners in Gabon¹⁵² who primarily mine gold and, to a lesser extent, diamonds.¹⁵³ Table 6 below includes more than thirty historic ASM sites and most are known to be active.¹⁵⁴

Province	ASM Sites
Estuaire	Kango, Kinguéle, Nkan, Tchimbélé
Haut-Ogooué	Bakounba, Moanda, Mounana, Okondja
Moyen- Ogooué	Between Lambarané and Fougamou, N'djolé
Ngounié	Etéké, Guietsou, Malinga, Mandji, Mbigou, Nzenzélé, Sindara
Nyanga	Between Mayumba and Tchibanga, Maobi, Mouenda
Ogooué-Ivindo	Batoula, the Belinga forest, Boka-Boka, Makokou region, Maybouth, Ntsenkélé, the Ovan zone along the Mvoug, along the river Oua
Ogooué-Lolo	Longo, Ndangui, Pana
Wolue-Ntem	Medouneu, Minvoul, Mitzié, Oyem, Minkébé, Masoko

Table 6: Known ASM sites in Gabon per province¹⁵⁵

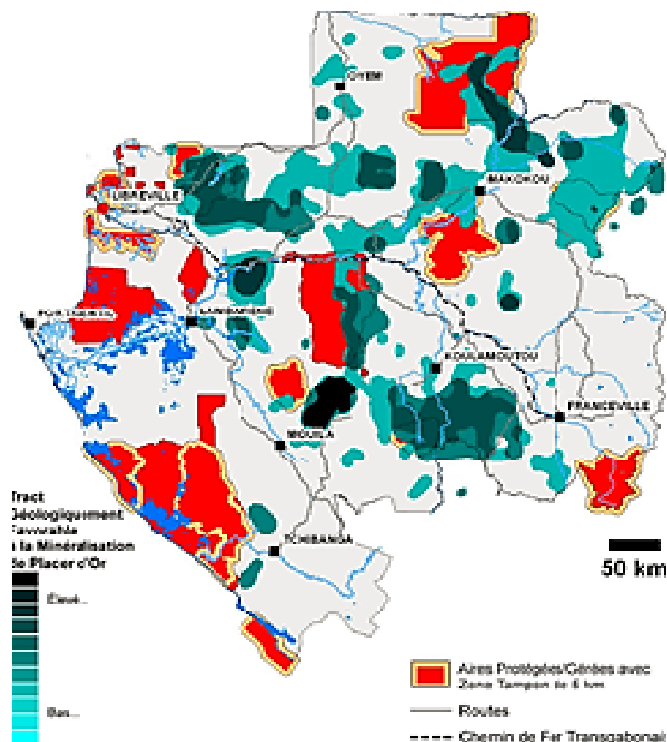
¹⁵² Fairtrade, SOFRECO

¹⁵³ Hayes and Wagner, 2008

¹⁵⁴ Lahm, Zoological Society of London, WWF

¹⁵⁵ Lahm, Zoological Society of London, WWF

While all of Gabon is considered by WWF and others to be part of critical ecosystems,¹⁵⁶ ASM has so far been confirmed as occurring within only three protected areas: Minkébé National Park, Moukoula Doudou National Park, and Monts de Cristal National Park. The mining camps at Minkébé are largely in the buffer zone of the Minkébé National Park. The camps in Minkébé and its buffer,¹⁵⁷ and those in Moukoula Doudou areas are inactive as of the time of this report's writing due to the 2011 eviction in Minkébé and Moukala Doudou's park director's decision to decline a request from a group of gold miners to reopen the Mendo site.¹⁵⁸ Therefore, Monts de Cristal is presently the only one known active ASM site inside a national park in Gabon; at that site the impact is deemed manageable¹⁵⁹ due to the low number of miners present.



Yet, while three national parks are known to be affected thus far, others are at risk. Figure 15 depicts zones in Gabon which, in geological terms, are likely to contain gold deposits. Several national parks risk being affected or mined by artisanal miners. While the map only shows the official protected areas, it is important to note that the entirety of Gabon is a critical ecosystem and therefore while ASM may take place outside of a protected area, the likelihood of it taking place in an area if High Conservation Value is very high.

Figure 15: Likely gold deposits in Gabon as they overlap with Gabon's protected areas. Source: IBI TOME 3

The lightest colour blue depicts low probability (grey none), while dark green depicts high probability of gold presence. The red zones on the map depict protected areas. Note: ASM within Minkébé National Park and its buffer zone have been closed from May 2011 onwards.

¹⁵⁶ Gabon's forests are relatively intact and with important biodiversity including large mammal populations throughout the country.

¹⁵⁷ By law, while ASM explicitly is allowed in a national park's buffer zone.

¹⁵⁸ Personal communication by Hollestelle with Sebastiaan Verhage, WWF programme manager Gamba complex, which includes Moukala Doudou.

¹⁵⁹ WWF-Gabon.

4. CASE STUDY: MINKEBE

Minkébé refers to the national park by that name as well as to a large artisanal mining settlement just outside of the park perimeters. This chapter will outline the history of the camp and its satellite camps, hereafter referred to as the Minkébé mining zone, as depicted in Figure 16. Figure 17 shows the area in a larger topographical context, including just how many artisanal mining settlements there are around Minkébé National Park as a whole. Next to miners, hunters and fishermen also have their settlements along the borders of the park, as Figure 17 indicates.

Minkébé camp has been an active gold mining camp since 1991.¹⁶⁰ In terms of government interventions, much of what happened in Minkébé is part of the generic ASM interventions Gabon. Still, some interventions were Minkébé specific and are hence specifically discussed.

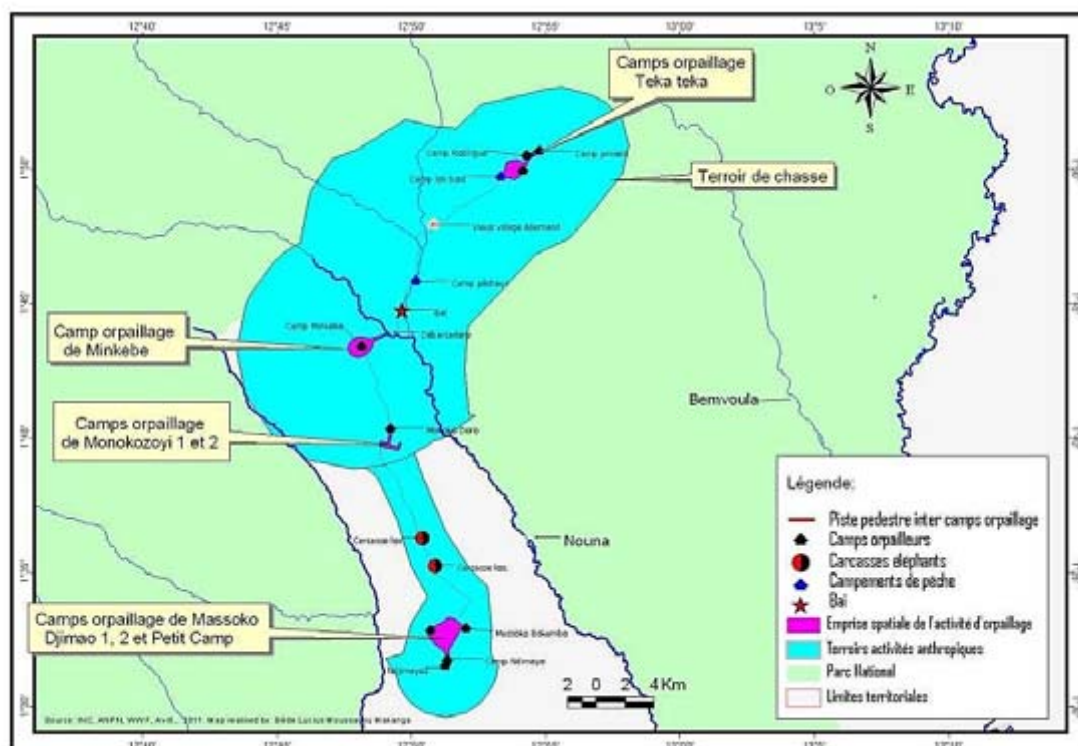


Figure 16: Minkébé ASM Zone and its surroundings. Source: WWF-Gabon.

The green on the map depicts Minkébé National Park, demarcated partially by the thicker blue lines which represent the rivers Nouna (east) and the Sing (west). The red lines on the map depict the trails going from camp to camp, where the camps are depicted by the black house symbols. Minkébé camp is the camp in which the red line takes a sharp turn west.

4.1 Interventions in Minkébé

Several stakeholders have, through the years, intervened in Minkébé: the Ministry of Mines, local authorities, WWF, ANPN, Ministry of Water & Forest, and most recently the Ministry of Defence.

4.1.1 Local government intervention

After the DGRM stations were pilfered in 1996, local authorities acted to fill the void caused through the absence of national coordination. As the regional economy in general and that of the city of Makokou in particular significantly benefited from the gold extraction and its related trade, after the departure of the DGRM agents, foreign-- mostly West African-- traders were allowed to return. The main reason for this was that, in the absence of government stores, the miners depended on the traders for supplies of food, tools and sundries. Yet, as discussed in more detail in the

¹⁶⁰ Lahm 2002

subsequent section on hunting, the West African traders and their networks seem to have since been at the nexus of ivory poaching.¹⁶¹ Hence, their return may have been welcomed by the miners, though not so by the elephants.

4.1.2 WWF efforts to curb the environmental impact of ASM around Minkébé National Park

Given their observed and presumed impacts on the Minkébé landscape, beginning in 1998, WWF-Gabon began to engage with the Minkébé mining populations. The first effort centred on evicting an elephant poacher from one of the mining camps. Since then, WWF-Gabon has undertaken several sensitisation and investigation missions to the region leading to several agreements between the camps, WWF, and local authorities.¹⁶² These agreements have typically included a ban on hunting of protected species, notably elephants (for their ivory), and other elements that were compulsory by law.

Additionally, non-commercial hunting of bushmeat was restricted to a 3.5 kilometre radius from the camps. There were tentative plans to control the arrival of illegal immigrants from Cameroon by coordinating with the Cameroonian local authorities. However, as the draft agreement list of potential signatories shows, Cameroonian authorities were not party to the agreements.

WWF-Gabon was determined to come to one agreement which included all necessary stakeholders, including national institutions such as the Ministry of Mines and the conservation authorities. After significant efforts over several years, WWF-Gabon developed a memorandum of understanding (MOU) to control the situation in some of the camps, in conjunction with representatives from some of the gold mining sites¹⁶³ and representatives from the following government agencies: The Ministry of Forest Economy, Water, Fisheries and Aquaculture, The Ministry of Mines, Energy, Petroleum and Hydraulic Resources, The Ministry of Tourism and National Parks, The Ministry of Interior, Security and Immigration, and the County Council of Ivindo.

The last draft version dates from 28 March 2008 and spans seven pages. The draft MoU aims to control hunting, gold mining, trade, and transport. Though never signed, the draft MoU prohibits the use of mercury, cyanide and other chemicals in the area, likely as a preventive measure. The miners present in the area needed to be in possession of valid '*Cartes d'Expert*', issued by the Ministry of Mines which was also to collect statistics on gold production and promote better mining methods. It is not clear if these new techniques were introduced to achieve better yields or to lessen the environmental impacts of the mining in these areas. Patrols of local security forces and other authorities were to guarantee the enforcement of the agreement. Most detailed in the draft MoU are the sections that aim to rigorously constrain hunting. Only subsistence hunting by miners identified as legal was to be permitted provided this hunting was of non-protected species with non-fire weapons or only with 12 or 14mm calibre rifles. Hunting grounds were to be restricted to a 3.5 km radius around the gold mining camps. Further hunting restrictions foreseen by the draft MoU were the prohibition of:

- Big game hunting and the sale of ivory and other trophies in accordance with the law
- Hunting of species that are entirely or partially protected
- Hunting along the rivers and Nouna and Sing
- Night hunting
- The bushmeat trade
- Holding rifles (458, 375 or others)
- Traps with wire rope.

¹⁶¹ Lahm 2002

¹⁶² Personal communication between Hollestelle and WWF-Gabon

¹⁶³ Mr. Alphonse Nkouka (Minkébé), Mr. Aloise Bakadi (Menkuka) and Mr. Pierre Simon Matamaya (Ngutu)

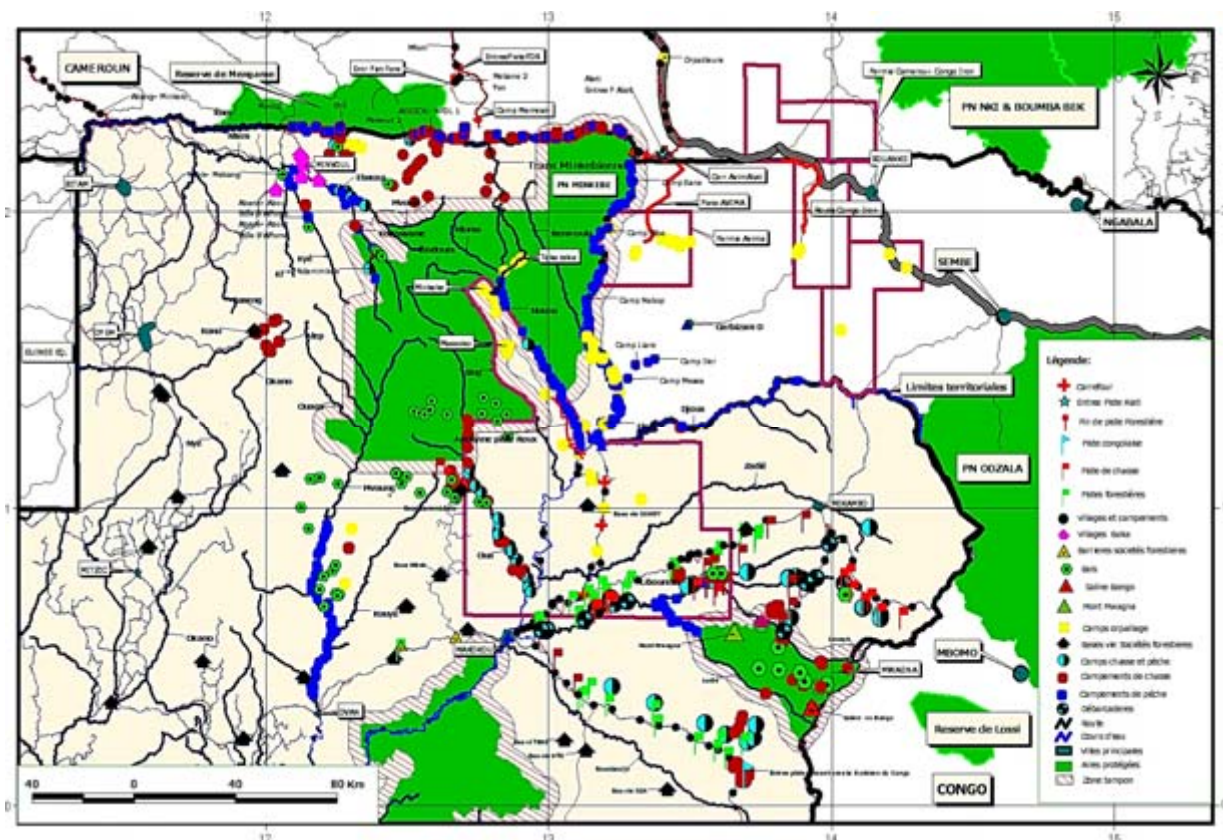


Figure 17: Minkébé mining zone and national park in topographical context

The yellow dots within the map represent artisanal mining camps, the blue dots fishing camps, the red-brown dots hunting camps, and the blue-black dots camps that combine fishing and hunting.

Furthermore, the draft MoU, aims to strictly prohibit the trade, transportation / circulation of:

- Guns
- Rifles
- Big game cartridges
- Wire rope
- Game, ivory and other trophies (skins of leopard, python, etc.)
- Illegal immigrants.

The draft MoU was never signed. This was apparently due to the influx of miners the camps in the Minkébé zone suffered from 2008 onwards. It was felt that the 4000 people in the region, most of them newcomers with whom the conservationists did not have existing relationships, rendered the regulations and activities anticipated by the draft MoU disproportionate and impossible to enforce. What is more, it was, and is still strongly felt by WWF-Gabon and the ANPN, that such numbers will most likely always be beyond the carrying capacity of the zone in terms of environmental impact.¹⁶⁴ In this author's opinion, it is unfortunate that the MoU was not enforced; its enforcement might have curbed the illegality and the increasing population numbers at the site. Indeed, the arrival of a semi – permanent a security force detachment in early 2011 seemed to already have chased numerous illegal immigrants from Minkébé camp.¹⁶⁵ Still, the alarmist feeling on Minkébé became widespread among conservationists and from there it reached higher authorities.

4.2 Intervention of the army: Eviction in May - June 2011

Several oral and written reports indicated a rise in Minkébé's population from roughly 650 to 5000 in less than three years.¹⁶⁶ The government took note consecutive action. Five motivations are said to have triggered the government's forthcoming approach:

¹⁶⁴ Personal communication between Hollestelle and ANPN and WWF staff

¹⁶⁵ Mbaza April 2011

¹⁶⁶ Koumbi 2010; Kengue; and personal communication between Hollestelle and Richard Rugiero from US Fish & Wildlife who had just come back from the camp together with Mike Fay, technical director of the Gabon National Parks Authority (ANPN).

1. The overwhelming majority of the new miners were illegal immigrants, mostly from Cameroon.¹⁶⁷ By some estimates, three-fifths of miners were Cameroonians and the remainder Gabonese.
2. In fact, as by law artisanal miners need to obtain a *Carte d'Expatriation*, and as no-one in the Minkébé region seemed to have one, all mining in the region was illegal.¹⁶⁸
3. With the influx came traders through whose initiative poaching for bushmeat and ivory, as well as other illegal activities were alarmingly on the rise.¹⁶⁹
4. Besides the poaching, through increased subsistence use of the timber and non-timber resources including fishing (which is illegal in the park, but legal outside of it) and through increased mining, the environmental footprint of artisanal mining, within the park as well as within its buffer-zone, increased dramatically and beyond carrying capacity.¹⁷⁰
5. The state realised it was missing out on taxes paid over millions of USD worth of gold.¹⁷¹
6. Combining 1 and 4, the local population, suffering from rising poverty as local development has not taken off, vocalised its discontent on local riches being taken by foreigners while the government remained absent. In a time when a new administration was aiming to favour of the local population for its plans to emerge Gabon from its developmental deadlock, such vocalisation counted.¹⁷²
7. Lastly, encroachment of ASM into the Minkébé National Park plus the ASM environmental impacts was deemed too detrimental.

Government action started with a public announcement in Makokou, 28 March 2011, by the president of Gabon promising to address the escalating artisanal mining situation.¹⁷³ Soon after the speech, the creation of a standing eco-police was announced; military brigades consisting of the *Béreets Rouge*, the best trained cadre of the military which are being trained for anti-poaching missions with the support of an NGO called Conservation Justice.¹⁷⁴ Though on anti-poaching missions, the brigades continue to have their military mandate and hence have a license to kill.

According to the Gabonese military authorities, on May 30th, notification was given to the miners to abandon the camp by May 31st.¹⁷⁵ On June 1, 2011 the Gabonese army went into the Minkébé zone and cleared all camps including the Minkébé camp itself. The purge led to between 2000 and 5000 illegal immigrants walking the 120 kilometre Trans-Minkébé trail to Cameroon.¹⁷⁶ The military remained in the area to also evict illegal fishing and hunting camps, and to occupy the camps to prevent the miners from returning.

Soon after the eviction, stories appeared in Cameroonian, Gabonese, and international media about alleged human rights abuses committed by the Gabonese army during the eviction. Allegedly, at least four people did not survive the walk to Cameroon, a pregnant woman had given birth while on the run, and one man had the map of Cameroon carved in his back by the military. Independent organisations such as the UN could not confirm the human rights abuses, and the man with the map carved in his back has so far not come forward.¹⁷⁷

After the initial euphoria over the eviction, governmental authorities woke to a crude reality. An evicted mining site can only remain that way by continuous military presence; something that puts a huge pressure on the small Gabonese army. Furthermore, the Ministry of Mines is currently paying a cost of 30 million XAF per month for the employment of the army to maintain the eviction; not surprisingly, this is draining the financial resources of the Ministry.¹⁷⁸

For several reasons the government of Gabon is interested in the possibility of re-opening the Minkébé mining sites and extracting its gold reserves in a more organised and sustainable form. Next to the interest in extracting the

¹⁶⁷ To support the thesis that rushes in Minkébé stem from the price level difference between Gabon and Cameroon, it will be worth comparing increases in population numbers in Cameroon from 2001-2011 with the population numbers in Minkébé during that same period.

¹⁶⁸ Personal communication between Hollestelle and the Director General of Mining and Geology

¹⁶⁹ Koumbi 2010 ; Mabaza 2011 ; personal communication between Hollestelle and WWF-Gabon and Conservation Justice staff.

¹⁷⁰ Koumbi 2010 ; Mabaza 2011 ; personal communication between Hollestelle and WWF-Gabon and Conservation Justice staff.

¹⁷¹ Personal communication between Hollestelle and Gabon's Director General of Mining and Geology

¹⁷² Personal communication between Hollestelle and well-placed anonymous sources

¹⁷³ L'Union, March 29, 2011

¹⁷⁴ Personal communication between Hollestelle and military experts and with ANPN staff

¹⁷⁵ See also http://gaboneco.com/show_article.php?IDActu=22726

¹⁷⁶ Different media have reported different numbers. Based on what was known on population numbers in the mining zone, 5000 illegal immigrants seems unlikely as Minkébé was by far the largest mining camp with over 2000 were reported living in the Minkébé camp alone.

¹⁷⁷ See also www.africatime.com/gabon/nouvelle.asp?no_nouvelle=604902&no_categorie=PRESSE, <http://gabonpage.net/actualites/actualites.php?Article=2195>,

http://generation-nouvelle.org/index2.php?option=com_content&do_pdf=1&id=505

¹⁷⁸ Personal communication between Hollestelle and staff of Ministry of Mines and Société Equatoriale des Mines

available minerals, an impetus to consider reopening is the demand from the Gabonese miners and, more pressingly, from the pit owners. Though outnumbered, the Minkébé zone was historically populated with Gabonese miners, pit owners and traders, though most Gabonese traders were ambulant.¹⁷⁹ Following the eviction, the numbers and power of the disgruntled people bereft of income were large enough to matter in the provincial capital of Makokou. It should in this context be noted that the Gabonese miners did not mourn the expulsion of the foreigners. In general foreigners were regarded as a threat, as the following observation of the *Brigade de Faune* on population numbers and the rich variety of foreigners in Minkébé indicates:

*“Following a mathematical calculation, in case of an ambush, a one Gabonese has on average 10 foreign adversaries. Hence, the Gabonese who live [in Minkébé] are in danger.”*¹⁸⁰

However, despite concerns about foreigners, it was the Gabonese who were the pit owners and the foreigners – mostly Cameroonians-- who performed the jobs which were simply not aspired to by Gabonese (e.g. working shifts in pits, running restaurants, small shops, etc.). However, these tensions exist. Throughout the last decade reports on Minkébé and other mining camps (e.g. along the Oua) consistently show a desire of Gabonese miners for their trade to be formalised and for the government to address the influx of foreigners. National governmental stakeholders now express a desire not to return to how things were. Combined with the government’s desire to control the gold trade, and added to that the Park Authorities’ desire for conservation, the notion of ESER-mined gold appealed to all parties as a viable solution.

For several months the chief of the SAT (see also this report’s section 3.5.6 on SAT), aided by other civil servants from the local Ministry of Mines chapter, discussed with the pit owners, totalling nine at the time, of Minkébé camp how to come to an agreeable solution. A new field mission, in which WWF took part, was undertaken to Minkébé camp to assess the situation. The consistent element in the communication thereon was the notion of cooperatives: it seemed cooperatives were seen as the *sine qua non* for reopening Minkébé Camp and apparently the pit owners were willing to organise their operations as cooperatives.¹⁸¹ This strikes as a bit odd as the construction of pit owner, some of whom are organised in veritable companies, seems incompatible with the notion of cooperatives as defined by Gabonese law. What is more, the manner in which labour was organised in Minkébé would likely be a sufficient social structure to use for embedding improvements and enforcing existing legislation; in essence imposing cooperative structures would bring little benefit.

4.3 Natural characteristics

4.3.1 Geology

Most of the area of the Minkébé National Park is made up by Archean, more than 3200 million year old, gneisses (see Figure 18’s pink area, code Aao). Metamorphosis of these old granites into gneisses has occurred through intrusion of younger (2900 million year old) granites (Figure 18 red areas, code Ao). During the same metamorphic event, the amphibolite greenstone belt (Figure 18 green areas, code Aba) of the Minkébé finger was formed from older mafic and ultramafic volcanogenic rocks and banded iron formations (BIF) were concentrated to potentially high grade Itabirite iron ores (Figure 18 brown area, code Abi). The original extension of the greenstone/ BIF area might have covered a larger extension, and the small greenstone/ BIF occurrences inside the Minkébé National Park, mainly extending from the tip of the finger towards East, are remaining parts of the same system. The gold originally contained in the greenstone belt has been further accumulated and concentrated by erosion into massive alluvial and colluvial deposits of more than 50m depth.¹⁸² Such deposits, as experienced in north east Gabon, are suitable and attractive for open pit extraction by artisanal and small-scale miners and potentially also by larger-scale mining operations.

¹⁷⁹ Lahm 2002

¹⁸⁰ Moudounga, 2010.

¹⁸¹ Field reports of Gustav Mbaza (WWF)

¹⁸² Depth assessment of 50 meters here is based on the depth of the pits related to in Minkébé camp

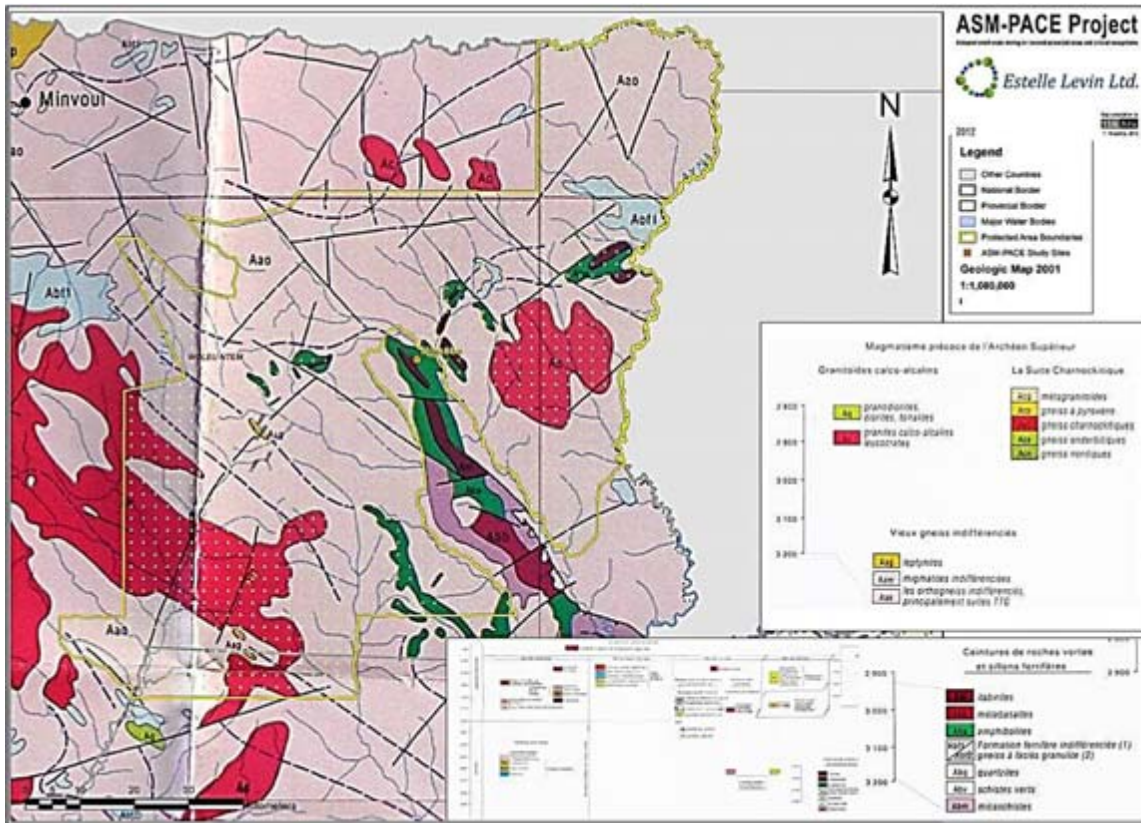


Figure 18: Geologic Map of Gabon

The map above shows an enlarged section of the 1:1,000,000 Geologic Map of Gabon. Clearly visible is the large intentional spatial coincidence of the “Minkébé finger” of the protected area, with a significant mineral deposit.

4.3.2 Impacts upon water

The Minkébé ASM zone and its larger surroundings lay within a closely-knit grid of waterways. The largest rivers are the Nouna and the Sing which demarcate the borders of the Minkébé finger, respectively in the east and the west (see also the map in Figure 16 in the beginning of this chapter). East of the Nouna, lies the Bemvoula River, which may also be affected by the mining in the larger Minkébé zone; the Tèka Tèka camp – considered a satellite camp of Minkébé—is located adjacent to the streams and creeks that flow into the Bemvoula River. On the border with Congo Brazzaville, the Bemvoula River becomes the large Ivindo River that runs through Gabon to Libreville; it may also be affected by ASM activities in Minkébé and also by the additional ASM camps along its shores, particularly along the Congo Brazzaville border. ASM activities in the Minkébé ASM zone have increased the incidence of



Figure 19: Following the evictions of the miners from Minkébé mining zone, the large pits of Minkébé turned into small lakes.

flooding in some areas. Following the 2011 eviction, the large pits of Minkébé turned into small lakes (see photo in Figure 19). While exacerbated by ASM activities, flooding can be a natural occurrence in this area; the topography is characterized by plateaus through which both broad and narrow valleys meander and the larger valleys are often periodically flooded.

4.3.3 Climate

The climate in the peripheral zone Minkébé Mwagna East is characterized by four seasons: two rainy seasons, between September and mid December and between February and June. The longer of the two dry seasons is from July to mid-September, and the other from December to February. Annual rainfall of 1500mm to 1800mm is among the lowest in Gabon. The average temperature in the region is 24 degrees Celsius.

4.3.4 Protected ecosystems¹⁸³

Minkébé Forest is a continuous forest covering 32,381 km² of which is bounded to the west by the Minvoul – Oyem – Lalara road, to the South by the Larara – Makokou road, to the East by the Ivindo River and to the North by the Cameroon Border. Minkébé Forest includes the 7567 km² Minkébé National Park. The park was established as a provisional reserve in 2000 but the Minkébé National Park itself was officially recognized and established by the Gabonese government in August 2002. It is recognized as a critical site for conservation by the IUCN and has been proposed as a World Heritage Site. The Fang people once inhabited the Minkébé area but, on becoming a protected area, the park now has no permanent human population. The name Minkébé derives from the Fang word 'Minkegbe', which means 'valleys' or 'ditches'.

The Minkébé Forest is part of the Congo Basin, the second largest forest block remaining in the world. This vast wilderness is one of the largest African rainforests and is sufficiently intact to play an important role globally for carbon sequestration and oxygen production - functions essential to reducing the negative effects of global warming. The Minkébé Forest extends from the Lopé west to eastern Congo. A wild and untouched flora mingles intimately with several-centuries-old trees. The park is at the source of three major rivers: the Sing, the Nouna, and the Bemvoula; large quantities of water originate from the park.

The Minkébé region and the national park itself are mountainous, with altitude that generally varies between 500m and 900m; the mountains are slightly higher. The highest point of the region is Mount Minkébé (937m). Several *inselbergs* exist in the region, which were formed millions of years ago. During the glacial ages, these were safe havens for animals and plants alike. These areas are thought to be at the heart of the region's current vast biodiversity, which is considered to be amongst the most important ecological places in the world. Today, this landscape remains barely touched by humans. The largest trees are hundreds of years old and reach fifty meters tall, some of which are topped with a wild garden of orchids and ferns.

Minkébé National Park is managed by two 'conservators' employed by the ANPN and based respectively based in Oyem, in Wolue-N'tem province, and in Makokou, Ogooué-Ivindo province. The conservators are assisted by eight eco-guardians, which is a staffing ratio of approximately one eco-guardian per 1000 square kilometres. Like the rest of the parks, Minkébé National Park is under tutelage of the ANPN. Next to state generated funds, the park benefits from the financial, logistic and human support of WWF-Gabon. Additionally, the park staff works in cooperation with the Ministry of Water & Forest and that of Defence, including the *Gendarmerie Nationale* and recently militarily-retrained eco-police.

4.3.5 Flora and fauna

The park's flora & fauna is not yet fully mapped but it is known to house a number of iconic species, including the forest elephant,¹⁸⁴ western lowland gorilla, black colobus, chimpanzees, mandrill, African golden cats, leopards, Bongo, the Giant Forest Hog, red river hog, porcupines, giant pangolins, and duikers, among others. IUCN Red List species found within this area include the Western Lowland Gorilla, Chimpanzee, Black Colobus, Mandrill and the Golden Potto. The park's diverse habitats provide homes for diverse species. For example, the riparian areas provide for species that require a water habitat, including the dwarf crocodile, spotted-necked otter, crested mangabey, sitatunga, and water chevrotain. Swamps provide habitat for parrots and pythons. There are several species of bird found within the park, including the spot-breasted ibis *Bostrychia rara* and Rachel's Malimbe *Malimbus racheliae*. The tree species *Sterculia subviolacea* is found in the Minkébé National Park and nowhere else within Gabon.

¹⁸³ <http://www.gabon-vert.com/les-parcs-nationaux/les-13-parcs-nationaux/le-parc-national-de-Minkébé>, http://wwf.panda.org/what_we_do/where_we_work/project/projects_in_depth/minkebe/minkebe_area/

¹⁸⁴ Minkébé is believed by the WWF to contain one of the largest populations of elephants in Africa

4.3.6 Land use/use of other natural resources

Land use within the surrounding areas is dominated by Minkébé National Park and thus is used for conservation purposes. Most of the Minkébé finger is also designated for conservation purposes as much of it falls within the park's buffer zone. Yet, as certain human activities are allowed in buffer zones, including artisanal mining, these areas are increasingly intruded by hunters and fishermen as well as the miners. In fact, the buffer zone is dominated by artisanal mining. Still, the increase in population and the steep prices for food imported into the zone led to a rise in forest clearing in and near the Minkébé mining camp for agricultural and livestock needs. Accordingly, agriculture in the area is geared towards food production, such as manioc bananas, vegetables, maize, etc. Disregarding little plots and banana and other fruit trees around houses, about 10 larger agricultural plots were counted in 2010 in and around Minkébé camp, all of which were exploited by Cameroonians.¹⁸⁵ The plantations of monocultures such as bananas well surpassed the limits as set out by the conservator of Minkébé NP; banana and other mono-crops are exotic species to the Minkébé NP and have grown fast and begun to crowd out other species.

Livestock within the active Minkébé camp had consisted mostly of pigs, poultry and sheep. Most of the animals did not live on allocated plots but rather roamed relatively freely around the houses of the owners. It is likely that the livestock, dead or alive, has left the camp with its owners as they are left unmentioned in reports from after the eviction.¹⁸⁶

The forest supplied the camp with non-timber forest products for medical and food purposes. Noticeable by the many wooden buildings in the camps in the larger Minkébé ASM zone, timber was also sought-after. The Minkébé camp housed a saw-mill where trees were cut into planks. Next to the saw mill, a minimum of ten chainsaws were spotted in 2010 by Moudounga, all of which were unregistered. The pit owners were among the owners, mostly using their chainsaws for wood to use in the mining process, e.g. to build sluices. Moudounga in 2010 noted that, where timber extraction was illegal in itself, the minimum tree diameters for extraction were not respected, thus further threatening the ecosystem.

Hunting

Other uses of natural resources with significant environmental impact are hunting and fishing. ASM activity in the Minkébé zone exacerbated the situation; there was frequent traffic to Cameroon and Makokou by traders, miners and transporters. There were several reports of intensive hunting in and around the Minkébé ASM camps.¹⁸⁷

As the Gabonese hunting season is closed from 15 September up to the 15 of March while demand for meat was stable throughout the year, 'hunting' becomes 'poaching' in this period.¹⁸⁸ Unfortunately, poaching is multi-faceted. Hunting in the buffer zone of the Minkébé NP is forbidden, and the camp and its surroundings are located practically within the buffer zone. Other forbidden elements that turn hunting into poaching are the use of forbidden hunting techniques.¹⁸⁹

Most worrisome to conservationists, was and still is the elephant poaching. The earliest reports on the mining zone indicate selling of elephant meat and the presence of a calibre rifle (.485) used for elephant hunting. The continuous rise in elephant poaching and the presence of criminal networks connected to this led to alarming the top ANPN executives in May 2011, leading to the ANPN to put its full weight behind the plan to evict the Minkébé ASM camps.¹⁹⁰ However, recently, as early as May 2012, ANPN officials who surveyed hunting activities in the larger Minkébé zone claimed that, although hunting activities have stopped in and directly around the Minkébé camp, poachers remain in the area despite the eviction of the artisanal miners. Worse, elephant poaching is still on the rise.¹⁹¹ The increase in elephant poaching could be due to a number of reasons. It could signal that the miners were not actually involved in the poaching (as the miners were evicted from the area in June 2011¹⁹²) and it may in fact be the work of an independent network of commercial poachers with powerful links.¹⁹³ Reportedly the criminal networks are

¹⁸⁵ Moudounga 2010

¹⁸⁶ Mbaza & Nquema 2011

¹⁸⁷ Koumbi, Mbaza 2004, Moudounga 2010

¹⁸⁸ Koumbi, Mbaza 2004, Moudounga 2010

¹⁸⁹ Koumbi, Mbaza 2004, Moudounga 2010

¹⁹⁰ Personal communication between Hollestelle and WWF and WCS staff

¹⁹¹ Personal communication between Hollestelle and ANPN staff

¹⁹² However, it is also possible that the increased elephant poaching could also be due to evicted miners who are now working exclusively in the ivory trade, rather than working informally in both sectors. Miners were not tracked after the eviction process nor are they being monitored, therefore the exact reasons behind the increase can not be said definitively, but at the very least it does find reason to question previous assumptions of a direct link between ASM and ivory poaching.

¹⁹³ Personal communication between Hollestelle and Conservation Justice Gabon

establishing small base camps throughout the forests to keep increasing their trade.¹⁹⁴ However, it is also possible that the increased elephant poaching could also be due to evicted miners who are now working exclusively in the ivory trade, rather than working informally in both sectors. Miners were not tracked after the eviction process nor are they being monitored, therefore the exact reasons behind the increase cannot be said definitively. For now, it is important to recognise that a miner who has become a poacher is not a miner but a poacher and hence miners who have become poachers do not in retrospective imply that they were poachers all along. Bereft of income opportunities, the miners were arguably easy recruits for the criminal networks driving the ivory poaching. *The question now then is: if the miners have become poachers, would they re-engage with legal mining and drop illegal poaching activities when given the choice?* In any case, if it is decided to reopen the Minkébé camps, a thoughtful strategy will need to put in place on how to control the presence of criminal networks. A controlled ASM sector where criminal networks do not stand a chance is likely to decrease the ivory trade more than has the eviction.

4.4 Social characteristics

As Minkébé camp attracted more and more miners, mostly from Cameroon, the camp became diverse in terms of nationalities, ethnicities, facilities, social structures, livelihoods etc. Being located all but in the national park, in a largely unpopulated zone, access to the camps was by boat, foot or helicopter. Anything substantial, be it utilities or canned food, needed to come from Makokou or was imported into the camp by the numerous Cameroonians who used the Minkébé trail (see previous Minkébé map) which leads to Cameroon.

In sum, Minkébé camp had all the characteristics of an unsettled-settlement which, from 1992 onwards, grew and shrank with the gold price until it was evicted in 2011, at which point its population was at an all time high. Though this section’s brief overview will try to do justice to the 20 years of Minkébé camp’s most recent lifecycle, as most information stems from the last ten years, the early years may lack detail. Still, for as far as could be traced, Minkébé was quite the standard Gabonese ASM camp until, in 2004, pit owners arrived who took mining to the next level. Hence, the most turbulent times of the recent lifecycles are well accounted for.

4.4.1 Demography¹⁹⁵

Minkébé camp opened in 1991, attracting miners from the region and even from as far as Longo.¹⁹⁶ According to Lahm, Minkébé camp peaked at about 1000 inhabitants in 1993, decreasing rapidly when the surface gold had been mined. Including the adjacent fishing camp, in 1995, population numbers ran between 300 and 350, and they continued to decrease. In 2000, according to Lahm (2002), the Minkébé ASM zone held a population of about 150 people.

Year	1993	1995	1997	2000
Population	1000	300-350	185	143

Table 1 Demography Minkébé in 1990s¹⁹⁷

The fate of Minkébé ASM zone turned however. Population numbers rose during consecutive years, largely due to the rise of the gold price. The increase of miners was also partially due to the arrival of pit owners. With their arrival came guaranteed payment rather than dependence on gold finds; many miners thus became employees of the pit owners. The first pit owner came in 2004, Mr Wora, who brought a small contingent of miners from Burkina Faso to the camp. Early 2005, Koumbi (2005) counted eleven foreign workers in the Minkébé camp, all illegal. Unfortunately, Koumbi’s report does not mention total population numbers.

¹⁹⁴ Personal communication between Hollestelle and ANPN and WWF staff

¹⁹⁵ For information on demography in the 1990s no other data was retrieved than the findings of Lahm (2002).

¹⁹⁶ Lahm 2002; Also per field research respondents in Longo

¹⁹⁷ Lahm 2002

Camp	Miners	Traders	Transporters	Others	Total
Itaba	6			3	9
Mangomba	12			7	19
Massoko	10			1	11
Mboka mabaka	4				4
Menkuka ville	12				12
Menkuka village	7	1			8
Menkuka campement	5			1	6
Minkébé	147	14	11	39	211
Ndondokondé	3				3
Ngoutou, Nyavom, supporter	77	18		30	125
Total	283	16	11	81	391

Table 2: Demography of the larger Minkébé ASM zone in 2007. ¹⁹⁸

As outlined in the table, in 2007 Mbaza counted 391 individuals in the larger Minkébé zone, 283 of which were miners, and 108 were traders, shopkeepers and transporters. In 2008, 665 people were counted for by a joint mission from the *Brigade de Faune, CEDOC* (the Aliens Branch of the Ministry of Home Affairs) and even some detectives of the gendarmerie.¹⁹⁹ However, in the mission report it is mentioned that these numbers may well underrepresent the total number of inhabitants as illegal immigrants had fled the camps to outrun the presence of the CEDOC officials. Bearing in mind the scattered illegal immigrants in hiding it seems a fair assumption to say that population numbers had doubled in one year's time.

In 2009, Koumbi, author of the first report mentioning the coming of West Africans in 2005, revisited the camp. Noting eleven nationalities, Koumbi counted 2,746 people of which Gabonese made up only one fifth (see table). A comparison of Koumbi's numbers with the 2008 numbers of the *Brigade de Faune*, shows an increase of approximately 300 per cent. Arguably, the Cameroonians, who in 2009 dominated the camps numbers with 53,5 per cent, were the bulk of the increase as will be underlined by the 2010 numbers of Moudounga.

¹⁹⁸ Mbaza 2007

¹⁹⁹ Edang Obame (2008)

Nationality	Numbers	Percentage
Gabonese	566	20,61
Mauritania	23	0,84
Congo Brazza	70	2.55
Cameroon	1469	53.50
Burkina Faso	39	1.42
Ivory Coast	200	7.28
Chad	22	0.80
Niger	207	7.54
Mali	122	4.44
Togo	5	0.18
Ghana	23	0.84
Total	2746	100

Table 3 Demography Minkébé in 2009.²⁰⁰

Moudounga counted 5,070 people in 2010 (see Table 10) of which 3,000 were Cameroonians who thus had strengthened their dominance in the camp to 59,17 per cent. Moudounga observed many of the foreigners being illegal in that they had no official permit and could not even produce an identity card from the country of origin. His outrage then, is thinly veiled in his report as he found out that these people had been issued by a field team of the Ministry of Immigration with unofficial permits.

The dominance of Cameroonians may possibly be explained through the existence of regular employee labour with a guaranteed wage. Most of the other nationalities arrived as part of a network of West African traders; some of these people may work in the mines, but they are principally there to acquire gold for their respective trading networks. Cameroonians are generally not involved as buyers in the gold trade.²⁰¹ The main reason for the large numbers of Cameroonians on site is due to the wages available on site: the shifts at the Minkébé ASM sites pay 10,000 CFCA per shift, allowing for roughly 240,000 CFCA in wages per month (1 shift each day for six days per week, for 4 weeks). Comparatively this is not a lot of money for a Gabonese national because, in Gabon, the minimum wage is 150,000 CFCA a month. In Cameroon however, 240,000 CFCA is almost worth double. Hence, working in the pits is an attractive livelihood for Cameroonians despite the wage of 10,000 per shift.

Moudounga's findings are estimates. Allowing Moudounga an error margin of 5 per cent, his numbers indicate a population increase of roughly between 2000 and 2500 people in one year. Accuracy of numbers and nationalities are somewhat debateable as the 2010 data no longer contain people from Burkina Faso, Togo or Ghana (67 people altogether) while Senegalese, absent in 2009, have entered the fray with a 250 person strong presence. This is not to say Moudounga's findings are off; they may well be correct or Koumbi may have been off. More to the point, none of the reports provide sources for their population findings though sources there must have been as it is highly unlikely the researchers have executed a head count.

²⁰⁰ Koumbi

²⁰¹ Mbaza 2011, Moudounga 2010, Koumbi 2009,

Nationality	Numbers	Percentage
Gabonese	500	9.86
Mauritania	20	0.39
Congo Brazza	350	6.90
Cameroon	3000	59.17
Senegal	250	4.93
Ivory Coast	200	3.94
Chad	50	0.99
Niger	200	3.94
Mali	500	9.86
Total	5070	100

Table 4: Demography per 2010.²⁰²

Whether the elevated number of 5,070 finally prompted security forces into action or whether it was the high number of illegal immigrants present, or whether it was planned as a result of the MoU engagements with WWF, the police employed a detachment to be stationed in Minkébé camp in late March-early April 2011.²⁰³ Consequently, population numbers went down to 1,888 people in Minkébé Camp alone.²⁰⁴ Mbaza (2011) suggests many illegal immigrants to have left to return to Cameroon or to pick up trade in nearby camps where of security forces held no presence.²⁰⁵ Neighbouring camps and their population in April 2011 include the following:²⁰⁶

Nr.	Name Camp	Population	Percentage
1	Camp Piment	88	3,84
2	Téka-Téka	40	1,74
3	Camp Rodrigue	14	0,61
4	Monokozoyi 1	15	0,65
5	Monokozoyi 2	26	1,13
6	Massoko	90	3,93
7	Djimao 1	65	2,84
8	Djimao 2	39	1,70
9	Petit camp	28	1,22
10	Main camp Minkébé	1888	82,34
	Total	2293	100

Table 5: Demography per April 2011.²⁰⁷

²⁰² Moudounga 2010

²⁰³ Mbaza 2011

²⁰⁴ Mbaza 2011

²⁰⁵ Edan Obame (2008), Mabaza 2011

²⁰⁶ Mbaza 2011

²⁰⁷ Mbaza 2011

Bearing Mbaza's own words in mind and acknowledging previous remarks of illegal miners dodging researchers, Mbaza's findings may also be somewhat off yet it is unlikely he missed roughly 3000 miners. Still, 3000 miners is the discrepancy between Mbaza's numbers and that of an ANPN mission which visited the zone for a couple of days in the midst of Mbaza's three week research for. The ANPN mission widely communicated their findings of 5,000 people thus underpinning the consecutive eviction mission.²⁰⁸

4.4.2 Key stakeholders

Key stakeholders as they come forward through the different reports over the years, representing both legal and illegal interests, are the following:

1. Miners, including all mining related activities but for pit-owners
2. Non mining family members of miners living in the camp
3. Families of those in the camp, yet themselves NOT living in the camp, dependent on incomes derived from the activities exploited in the camp
4. Hunters
5. Fishermen
6. Poachers
7. Commercial agriculture / livestock practitioners
8. Pit owners
9. Traders (including shopkeepers) and others exploiting bars, hostels etc.
10. Saw mill workers / owner
11. Transporters
12. Religious congregations
13. Belinga Concession holder
14. County Council of Ivindo (Conseil Départemental d'Ivindo)
15. Ministry of Mining
16. Ministry of Water and Forest
17. Ministry of Interior, Security and Immigration
18. WWF and other civil society conservation organisations
19. ANPN

4.4.3 Main livelihoods and incomes

Incomes are derived from the following activities

1. Agriculture
2. Livestock
3. Bar / Dancing
4. Restaurants
5. Shops
6. Prostitution²⁰⁹
7. Mining as owner
8. Mining as employee
9. Independent artisanal mining
10. Gold trade
11. Transporting
12. Hunting
13. Fishing
14. Sawing of timber logs
15. Collecting non-timber products
16. Corruption²¹⁰

²⁰⁸ Communication with Mbaza and other WWF / WCS / Conservation Justice staff

²⁰⁹ Though other authors / experts confirmed their presence, Koumbi's (2009) is the only report to openly describe the presence of prostitutes. Recommendations of other reports for AIDS awareness programs in Minkébé camp may well be considered to be more covert references to their presence.

²¹⁰ Lahm (2002) and conversations with Minkébé experts

4.4.4 Organisation of Minkébé ASM zone camps²¹¹

The site in Minkébé was operated under the authority of an interim chief named Alphonse Nkoua.²¹² The chief was assisted by a General Secretariat, a union of miners, and the mining consultants. The administration played a key role in organising the camp and in the resolution of social conflicts. This leadership was the main point of contact for anyone, a benchmark that had a power of decisions unanimously recognised by the inhabitants. The representatives of the chiefdom were subject to the exercise of 'influence', a trait that characterises the traditional political organisation of Gabonese settlements. As such, representatives were representatives of collective interests only when they were listened to and considered. Consequently, the chief and his crew needed to strike a constant balance to keep the majority happy. As a result, it must have been all too hard for the chief to introduce regulation of mining and other practices which may affect income generation for the most powerful, whether most powerful by number (i.e. population size), or most powerful by influence (i.e. through power concentrated in a person such as pit owners). Only outside interference with a power to enforce could assist in bringing about such changes. Obviously, outside authorities did not succeed until the eviction.

Bearing the above in mind, it is fair to say that in terms of organisation Minkébé Camp had become somewhat of a standard Gabonese village. Due to the services available there, Minkébé functioned as the centre of the larger ASM zone. In other words, the neighbouring camps can be regarded as satellite camps of Minkébé Camp.

4.4.5 Socio-cultural diversity

While Minkébé became somewhat a traditional Gabonese village in terms of leadership, the same cannot be said about its socio-cultural diversity. Minkébé population consisted of all ages, sexes, numerous African nationalities, and a wide variety of Gabonese ethnicities.²¹³ Children were not so much involved in mining. As is often seen, children of school-going ages and adolescents only appear during school breaks to either be with their parents or to earn money for their education.

The different nationalities stuck together, not only in terms of support, but even in terms of living quarters: the camp had a quarter where one would find only Cameroonians while West Africans, who shared the Islamic religion and the culture dominant on the southern fringes of the Sahara, mingled to a greater extent. Gabonese, in turn, also clustered together.²¹⁴

As there were different places of worship, there were different congregations, Christian and Muslim. These were, next to the leadership structures, the sole social structures present for as far as the data reports: no reports of other cultural or social groupings were found in the numerous reports.

4.4.6 Living conditions

In general, compared to other camps where no pit owners were found, living conditions were quite reasonable bearing in mind the camp lies isolated in the very midst of a tropical rainforest. Minkébé, in the end, counted over a 1000 dwellings. These were made of wood, leaves and clay. The pit owners had their own quarters, consisting of larger houses though also made of wood.²¹⁵ The village-like level Minkébé achieved in terms of available services, made the camp a relatively comfortable place to live. Still, there was no hospital or other state services, such as schools. Though this is not so unusual in Gabon's smaller villages, the isolated nature of the camp made Minkébé a dangerous place to live when things did go wrong. For medical services people depended basically on Makokou or on Cameroon, both 2 days travel from the camp for a healthy person.

4.4.7 Health and security

Apart from some hunting rifles, the camp had no arms proliferation to speak of. Though the occasional fight occurred, serious injuries or theft seemed to have been rare. However, there have been periods in Minkébé's history when security has been more fragile. As mentioned in the section on organisation, in the early 1990s, during the first rush, the camp witnessed violent clashes. The appointment of the village chief by the Makokou administration filled the

²¹¹ Lahm (2002), Moudounga (2010)

²¹² He is somewhat of a 'circumstantial' chief because the leadership at Minkébé hold no official administrative status. Still, as the chief has been positioned in the camp by the Makokou administration after violent struggles over leadership of the camp, the chief is linked to the local administration. Lahm (2002) mentions the violent clashes without mentioning a year. Given that population numbers decrease rapidly from 1994 onwards, it is likely these clashes occurred around 1993.

²¹³ Koumbi (2005, 2009), Mbaza (2007), Moudounga (2010), Edang Obame (2008)

²¹⁴ Mbaza 2007

²¹⁵ Mbaza 2007

leadership void and calm returned until Mr Wora and his crew arrived. Mr Wora, the first reported pit owner, arrived in 2004 with a team of foreigners (Burkina Faso) and with a security team carrying automatic rifles.²¹⁶ This led to and increased a palpable sense of insecurity, e.g. one of the Mr Wora's security staff took his rifle to a bar fight and threatened a miner.²¹⁷ It is unclear how the situation was resolved, yet later reports no longer mention the presence of Mr Wora's armed security forces. It is possible that local authorities stepped in, as in Gabon the carrying of automatic rifles is restricted to government security forces only.

Sicknesses did not differ from other villages in the forests of Gabon; several types of fever, malaria etc. Much of this is curable with rest and medication. One could even continue working with malaria, when recognised at a very early stage and when using medication. In general, the more ferocious strain of malaria, cerebral malaria, allegedly does not exist in Gabon. In 1994, the region suffered an Ebola epidemic and while Ebola has not returned since, the region is still at risk.²¹⁸

In addition to these serious illnesses are common work-related injuries. There are no reports of health and safety measures being taken by the miners. Nor do any pictures show anything resembling a safety measure, not even a helmet or so. That said, the terraced pits where the majority of the people worked hardly risked collapsing, particularly not when compared with the pits of independent miners. However, the latter type of pits was the standard pit in and around the satellite camps, making the risks greater there. The reports do not mention injuries, let alone fatalities, yet the physical demand ASM makes of the body comes with regular aches, mostly in the lower back, and anarchic artisanal mining without fatalities is a rare feature anywhere in the world.

4.4.8 Education and skills

Little is known about the skills of the Minkébé camp population for as far as it does not concern their skills to do what they came to Minkébé for, e.g. the skills for agriculture and mining were present.

Students are known to have worked in the camps for shorter periods of time to earn enough for their tuition fee, which is about all that is known with regards to the education levels of the Minkébé population. As mentioned above, no schools were found in Minkébé camp.

4.5 ASM in Minkébé

4.5.1 Organisation of mining activities

In Gabon the mode of pit ownership in Minkébé and related modes of production (extraction) stands out. In fact, the notion of a pit owner is not that uncommon in ASM in general or in Gabon in particular for that matter. Individual miners start working the ground somewhere, which then becomes their pit. This is 'soft ownership' in that there is no enforcement other than the ancient code among miners that such is the way of the miner. Other miners can then start working the pit against a certain fee, either fixed or a percentage. Also, families sometimes work a pit together, particularly during the school breaks when children and wife may join the miner in the camp. In sum, such customary ownership is not the same level one finds in Minkébé where 'owners' arrived who had and have never mined in their life. Rather, they brought cash and foreign workers willing to work hard for fixed payment.

²¹⁶ Koumbi (2005)

²¹⁷ Koumbi (2005)

²¹⁸ Lahm (2002)

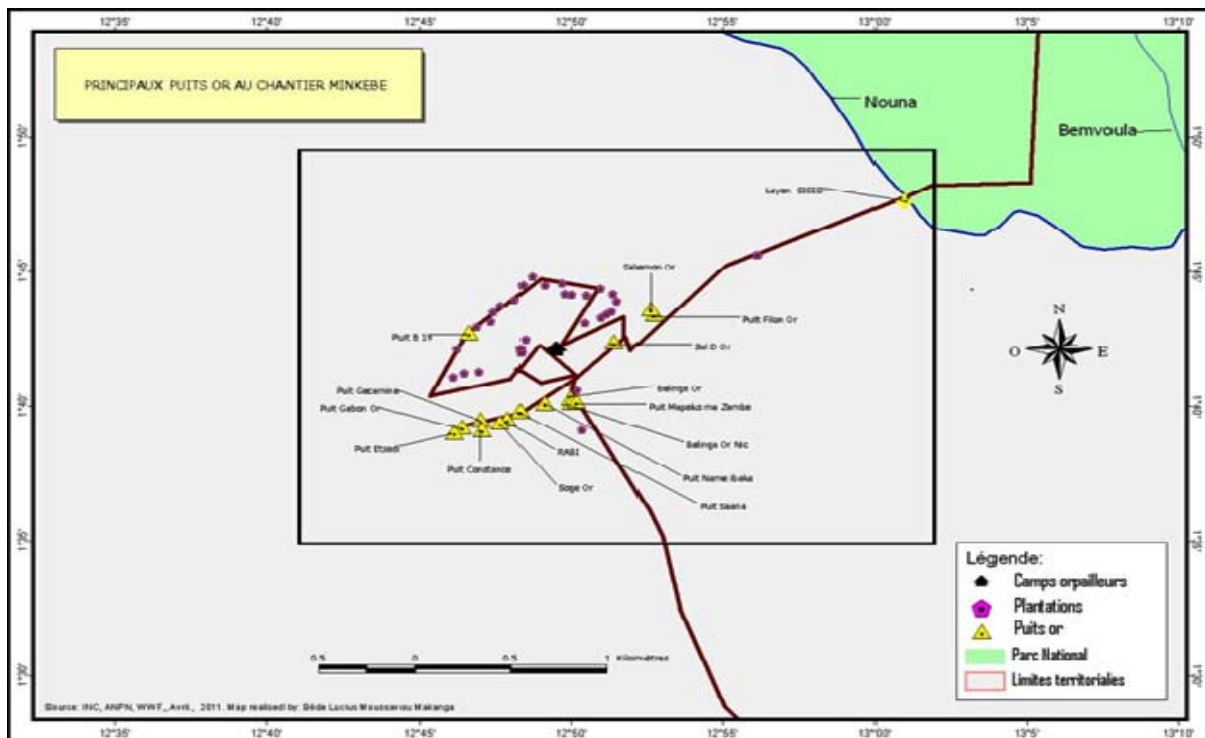


Figure 20: Principal mining pits in Minkébé ASM zone (Mbaza 2007)

Such a version of pit owners in Minkébé seems to be a feature of the last ten years as Lahm (2002) does not mention pit owners in her detailed 2002 work. The first mention of pit owners would seem to be by Koumbi in January 2005 as he mentions a pit owner called Mr Wora. Mr Wora, at the time was also director general of the National Real Estate Corporation. In other words, he was a well-connected man, part of the Gabonese administrative elite.²¹⁹ Though unclear when exactly, Koumbi (2005) mentions Mr Wora's organisation, *Gabon d'Or*, to have been established for some time already. Hence, pit owners surfaced somewhere between 2002 and 2004. As far as can be retrieved, Mr Wora was the first owner to enter Minkébé. With his entrance, the camp commenced its development from a camp into a village-like settlement with hairdressers, hostels and prostitutes.²²⁰

Mr Wora's connections were accentuated by the fact that he flew in his crew with an army helicopter for which he had people clear the ground to create a helipad. His security crew carried automatic weapons, a rare sight in Gabon, yet such weapons were easily obtained in neighbouring Congo-Brazzaville, less than 50 kilometres by helicopter from Minkébé. Mr Wora's men, many of whom were from Burkina Faso, were openly involved in ivory poaching engaging the local Baka population as hunters. Complaints about the sharply increased aggression and insecurity were directly linked to Wora's outfit.²²¹ Koumbi's report is a passionate cry for action; a cry that may have been heard as neither Mr Wora nor his automatic weapons resurface in consecutive reports.²²²

²¹⁹ Koumbi, 2005

²²⁰ Koumbi, 2005

²²¹ Koumbi, 2005

²²² Within the time and resources available, specifics regarding the disappearance of Mr Wora could not be retrieved.



Figure 21: Owner's pit in Minkébé. Photo by Koumbi, 2009

After Mr Wora, Mr Zondo surfaces in reports as the biggest player, while Mr Wora is not mentioned after the 2005 report of Koumbi. Then, later reports also mention Mr. Marcel, while no longer mentioning Mr Zondo. Consequently, in the 2010 report of Kengue, Mr Zondo resurfaces as the owner of the Bemoussi pit, albeit as Ms Zondo, alongside three other pit owners: Ms Constance owner of the Bemoussi Junior pit, Mr Yvon owner of *Gabon d'Or*, and Guelle Afanne owner of GECAMIN / Salon d'Or. Noticeably, the pit which was Mr Wora's in 2005, *Gabon d'Or*, had apparently changed ownership as in 2010 reporting the pit is allegedly Mr Yvon's. In other words, reporting on the pit owners is inaccurate, both on ownership structures as on means of operation. Given the important role pit owners played, the pit owners seems worthy of a dedicated in-depth study as any potential reopening of Minkébé will include these powerful players.²²³

From the logic of pit owners basically follows the logic of deep pits, as seen in Figure 21, for two reasons. First and foremost, as pit owners established themselves alongside one another, once the borders of their operations start nearing one another, one cannot progress any direction but down. Sure enough, the pits started out some distance from one another, but over time, as the profits kept coming, the pits kept spreading out and risked touching fringes. Digging was performed by employees working in shifts. The pit-owners' capital made this employee-structure possible, which in turn made the deep pits possible through their labour. Alluvial gold sedimentation tends to come in layers. There is a productive level, after which production starts stalling. About at that stage or a bit deeper still, one finds quartz gravel. It is only underneath this level of gravel that new gold findings occur and the circle starts all over and over until miners hit bedrock.²²⁴ In sites with low mining pressure, individual miners are usually discouraged when production starts stalling. Would they continue and hit the gravel layer, miners in Gabon tend not to persist.²²⁵ Perhaps indicating the fatalistic perception of gravel is that the gravel layer is called the bedrock, though of course it is not. Hence, if not already when production starts stalling, when the gravel layer is reached, individual miners tend to move on as they consider the pit to be exhausted. If moving on brings no results, miners move on to a different ASM zone. This process also explains why Minkébé was producing the gold it did at the time of eviction while in the year

²²³ Mbaza (2012), conversations with WWF & Ministry of Mines staff. Indeed, Mr Zondo surfaces in each of the, verbal and e-mail, reports on the local negotiations in Makokou to reopen Minkébé. Remarkably, he is continuously referred to as a artisanal miner (*orpailleur*) rather than as a pit owner.

²²⁴ Bedrock levels were not hit in Minkébé judging by the pictures found in the reports cited

²²⁵ Confirmed by researchers in Minkébé zone, by Chef de SAT Alain Biveque and by the research' own findings.

2000 the camp was all but deserted since the fields were considered not productive.

The pit owners, who were able to invest more profoundly in their operations thanks to their financial, and through that, labour resources, continued digging when production stalled and found new gold deposits right underneath the old ones.²²⁶ Individual miners simply could not afford to be without income for that long and hence did not dig deeper. Yet, once, with the arrival of the owners, it became apparent gold was to be found underneath deserted pits, individual miners tried their luck as well, leading to the reopening of the satellite camps such as Tèka Tèka to the north-east of Minkébé camp. Still, as the pit owners specialised their labour force and as they had two and some even three shifts a day, naturally, their pits became wider and deeper when compared with those of independent miners. Indeed, pit depths of over 40 metres have been recorded in Minkébé, as can be seen in Figure 21.

Though the techniques in the open pits of the large pit owners were apparently no different from that of the more rudimentary artisanal pits of the single units, they were more specialised in the quasi-industrial pits performed by numerous employers. Indeed, the organisation of these owner pits seemed to be more in line with the Gabonese Mining Code's definition of small-scale mining than with artisanal mining as it involved employees and a certain turnover well above the minimum stipulated in the code.²²⁷

4.5.2 Mining techniques

If not for the depth of the pits through terracing and for the organisation of labour in those big pits, Minkébé does not differ from other mining sites in Gabon in terms of techniques used: motor pumps, hoses / tubes / piping, basic sluices with riffles, pans, shovels and crowbars. Interestingly, from an economic development point of view, investment in capital had not at all replaced labour. This indicates wages were low enough for owners not to be interested in making the process more capital intensive by even slightly investing in more optimal techniques, e.g. mats (see also mining technique section in Annex A). In Figure 22, the author highlights some elements outlining the specialisation of labour.

In the green marking at the bottom-left of the picture one can see a flood light allowing the shifts to continue in the dark. Top middle, in the blue marking one sees a group of sluices indicating where the gold is concentrated. The piles left and right of the sluices show the earth that is still to be washed. The fact that in the pit there are neither sluices, water, nor pans are further indications that the gold processing is clustered at the top fringe of the pit. Underneath the sluices, in the yellow-orange marking, one sees a wooden structure that prevents erosion thus helping maintain the structure of the pit and keeping the lower terraces from refilling with mud. At the bottom right of the picture, not connected to tubes or other piping, one sees a motor pump. Not marked, but in the hand of every other person in the pit are the shovels. Though not really a technique, marking the notion of large pit owners is the fencing one could see around the sluices, most visible on the left of the sluicing area.

While thus in the owners' pits the level of organisation and specialisation neared that of small-scale mining, the techniques used were more akin to artisanal mining. Still, the picture on the right shows just how much more undeveloped the techniques used by the independent miner were. Though no doubt a resourceful construction, the use of a portion of a wheelbarrow cannot be considered optimal.

²²⁶ On a side note, this process also took place in the famous Kimberly mine in South Africa. Barney Barnato bought concessions of disillusioned miners for a song and became the largest and most successful diamond delver in Kimberley. His company was at the heart and start of what is now known as The Beers Diamond Company, world largest diamond miner.

²²⁷ SOFRECO, Mabaza 2011, pers comm with WWF-Gabon staff



Figure 22: Organisation of Minkébé pit

4.5.3 Gold production

It is impossible to say how much gold, and hence money, was involved in the Minkébé gold trade in totality, but the 2008 report of Edang Obame (2008) does highlight the largest pit, owned by Mr Antoine Zondo. In 2008 Mr Zondo's pits employed 300 people per day. Daily production fluctuated between 500 to 1000 grams. Employees were paid 10,000 XAF per shift and work one shift per day. This makes 3 million XAF per day that Mr Zondo's company paid out to its employees. The money was directly found on site at Minkébé by selling the gold to traders. As there were quite some larger pits of pit owners and as there were numerous independent miners outside Minkébé camp, production numbers could well have reached anything between 2,000 to 6,000 grams a day. As most of the 'pit-owner-pits' operated 7 days a week, taking an average overall production of 3000 grams for the entire zone, allowing for 300 working days a year, yearly production could well have surpassed 900 kilograms²²⁸; some 600 kilograms above annual production for the whole of Gabon as reported by the Ministry of Mines and depicted in the graph at the end of Chapter three.

As pits produced enough to employ over 3000 miners in 2011, and as the pits were terraced, it stands to reason that the Minkébé ASM zone still holds significant amounts of artisanal, gold.



²²⁸ At a rate of \$50 per gram, this is equivalent to 45 million USD.

4.6 Environmental impacts

For conservation purposes, the poaching that comes with large commercial human settlements in the forest is most alarming. Ivory poaching is reaching a new height every month. As the poaching continues in the absence of miners, it is clear ivory poaching has reached such lucrative dimensions that it has become organised. Thus, it no longer needs a human settlement such as Minkébé as a base camp; now the criminal networks establish small base camps throughout the forests to keep increasing their trade.²²⁹ Yet, in and around the ASM zone, the deployment of security forces and eco-guards has led to an eradication of the trade, thus drawing attention to the key question of ASM vs. conservation in Gabon: as the ivory poaching continues and even intensifies without ASM present, and as law enforcement has annihilated the ivory poaching in the Minkébé ASM zone, can the ivory poaching really be directly linked to ASM?

Whether or not the ivory poaching is directly linked to ASM, the fact is that the presence of the miners in Minkébé camp, combined with the steep prices of food products imported from Makokou or Cameroon, led to a subsistence demand to bushmeat which in turn attracted commercial hunters. Even if done legally, e.g. respecting the seasons and the means of hunting, the subsistence demand of Minkébé camp extended the carrying capacity of the 5 kilometre zone around the camp which in Gabon is normally allocated to subsistence hunting and other extraction of natural resources.

Direct impacts were assessed in November 2011, after the eviction, using the Participatory Environmental Impact Assessment tool from the ASM-PACE toolkit. The assessment was performed by Serge Nguema, a member of the first ASM-PACE research team mission to Longo & Ndangui.²³⁰ The impact on groundwater levels is profound. To keep working the deep pits, water needs to be constantly extracted by motor pumps. What was an active deep pit just before the eviction in May 2011 has now become a deep human made lake with water levels up to ground surface level. As no environmental impact monitoring has taken place in Minkébé other than anti-poaching missions, it is unclear what the real impacts are on the wider environment. The excavation activities came with the clearing of forests; forests which were once the habitats of more or less endangered animals. Since the camp was evacuated, vegetation is gradually taking over the top soil, as it takes over the houses, the pits, and the areas devoted to agriculture. Moreover, the soil around the pit is clay soil, which is conducive to erosion. There have been mudslides around the largest pits due to the fragility of the soil, in turn resulting from the artisanal mining. The air quality is relatively changed because of the stench from sewage and food waste left in the open air. Still, no detrimental air quality differences were noted. The debris and the septic residue are more prone to affect the water. There is a high rate of potential leaching from storage to the free area, without protection against rain, material and the presence of "very thin layers of oil" on the surface of stagnant water from the gold extraction site resulting from gradual pollution that is to say, the drip of the fuel contained in cans, motor pumps and generator groups into the (ground) water.

During the November mission, a diversion of the River Minkébé to support mining activity was noted. Furthermore, sediment deposition of limestone in the river led to significant changes of the water composition. As said, significant waste around the pits as well as at the household level was omnipresent. This is due to the lack of public awareness on collective waste management in Gabon generally. Moreover, the deposition in the open air of heavy materials and bulk waste contributes to land degradation particularly in the storage areas, around pits and in the camp.

²²⁹ Pers comm ANPN staff

²³⁰ Mbaza & Nguema 2011

5. CASE STUDY: NDANGUI

Ndangui is an ASM zone, a canton (county) and a *regroupement*, a group of villages under one administration. The research's scope was of the *regroupement* level which is part of the ASM zone referred to as Ndangui. *Regroupement* Ndangui consists of three settlements called La Chute, Venez-Voir and Popa. Together, the three villages house some 600 people. At some distance from Popa, more ASM settlements can be found though these are outside the Ndangui *regroupement*. However, issues of accessibility and time (including the other villages would have meant new introductions with the leadership and more travel) prevented inclusion of these nearby settlements in the research. Any future research would benefit from including these settlements, as most government and NGO visits are limited to the *regroupement* Ndangui.

5.1 History

The Ndangui ASM zone was founded by two brothers. One is now *chef de Canton Ndangui*, the other is *chef de regroupement Ndangui*. As the latter is the source of the story, the story may be beautified and the role of some glorified. Indeed, one person approached a research team member whilst claiming the story was absolutely false. Still, when checked with most miners, they confirmed the larger outline and only smiled mildly when we asked about the heroics. Also, the report acknowledges the aid of Mr Jean Louis Albert who has recounted the story of the founding of Ndangui on his website, having visited Ndangui in 2009.²³¹ The reporting is constrained to those elements of the story as shared with both Mr Albert in 2009 and with the research team in 2011.

For as far could be established, the three brothers founded and developed the Ndangui ASM zone. Even before independence the three brothers worked for French gold prospectors in Ndjolé and thereafter in the surroundings of Longo. Hence, they were familiar with ASM prospecting techniques and with the money to be made with mining. One day, and as Mr Albert aptly writes “this is where history is tied to legend”, one of the brothers Alphonse Ma was visited by a genie in a dream.

At the time the brothers lived near Lastourville and they often went hunting in the environs. The dream showed a landscape and explained that, if he went to a certain river, over 3 days of walking, he would meet a wonderful place, where wealth was waiting. But for this he should allow himself to be guided by the genie who gave him the dream. Also, upon arrival at the riverside, he should not touch the large gold nugget that he would see there.

Alfonso Ma went on an expedition for several days with his brother Nd. Bernard. They walked long in the forest, guided by the genie that was floating in his mind. Then they came to a river that looked exactly like the dream. Ma Alphonse knew then that he had arrived at the location indicated by the dream. He stopped and scanned the surrounding area. Then and there he found a huge nugget. He knew then that it was the nugget the genie had warned him about. The revelation could no longer be denied. He remembered his dream and steered clear of the nugget. But he had forgotten to tell his brother, and Nd. Bernard took the nugget in his right hand which was attacked immediately by the occult forces which protected the place. It is since that time he his hand has limited functionality, “*effects of a fault in the very distant time*”.²³² In the above picture the hand lying on top is the hand affected.

After this discovery, the two brothers reported their findings to the authorities and, with permission, began to seek the gold veins around. After this discovery, they began operating at a small scale, then hired workers and gradually the village grew. That was in 1962. This was the beginning of the existence of Ndangui, born in the middle of the forest. From the beginning onwards, SOGAREM supported the opening of the zone with technical and other support. What is more, agents of SOGAREM bought the gold on site, leading to the first peak in Gabonese gold production as depicted in the graph in chapter 3. It is unclear exactly when and why SOGAREM, and the government as such, withdrew, yet they did in the late 1960s.

²³¹ <http://carnetsdevoyages.jeanlou.fr/page125/page125.html>

²³² <http://carnetsdevoyages.jeanlou.fr/page125/page125.html>

In the 1980s, Ndangui was also part of the operations led by Mr Gilbert. In Ndangui La Chute, what is now the schoolyard or public square, used to be the helipad where the helicopter of Gilbert landed (see adjacent photo).²³³ What is now a bar cum shop, used to be the outlet store of the Gilbert outfit. The miners, including the *chef de regroupement*, could not confirm or deny whether Gilbert's outfit was part of an effort of the Ministry of Mining or not. What is more, they even did not have any other details of Mr Gilbert and his outfit; neither Mr Gilbert's nationality nor his first name or any other name of the employees involved. What is of interest in that regard is that this seemed to indicate the miners accepted his presence and his operations without having knowledge of his authority to buy gold. Pressed for an answer as to why they accepted the Gilbert operation they gave two reasons. Firstly, the fact that Gilbert came by helicopter of the Tigre type. This they had come to know as a type used by the president and hence, by default, Mr Gilbert was believed to be linked to the president.²³⁴ A second reason mentioned by the miners was the fact that they liked the deal Mr Gilbert offered: supplies, medicines and tools in a shop on site in return for selling gold. What is more, as all-terrain vehicles were rare in those days, and as the forestry road which currently connects Ndangui with Lastourville did not exist, even the possibility of selling gold on site was a benefit. The improved living conditions which came about thanks to the Gilbert operations, attracted more miners, and Ndangui grew until in 1989 Gilbert's operations ended in Ndangui as everywhere, without notice or replacement. This led to a departure of quite some inhabitants, particularly women and children, as the living conditions degraded back to the harsh conditions they had been before Mr Gilbert, yet this time with a bitter memory of better times.



Figure 23: Bernard, co-founder and now chef de regroupement of Ndangui



Figure 24: Ndangui Venez Voir: helipad & outlet (far-right building) of former Gilbert operations. Left two buildings now house the Ndangui school.

Without the regular supply of Mr. Gilbert stocking the grocery stores and without his buying of gold, miners had to go to Lastourville, even more of an ordeal in those days than it is today without roads or cars. To curb this situation, and as the miners had no experience in such commerce, in the early 1990s the *chef de regroupement* invited the Lastourville shopkeepers to run the shops and restaurants in Ndangui. These shopkeepers were all foreigners, all perceived to be from Mali, though not all of them are. In fact, they are all West Africans from the region on the southern fringes of the Sahel, be they from Mali, Senegal or Niger. Still, as these foreigners share cultural elements such as drinking tea and wearing specific West African attire, and as these people were all Muslims praying in Arabic, it is not hard to imagine they were and are referred to as *Maliens*. From Mali or not, the *Maliens* sent their men to open shop in Ndangui and organise steady supplies. This must have been sufficient to make decent profits as they

²³³ The Tigre helicopter is a model of the back then French state arms production company.

²³⁴ Though it is not known when exactly, older miners / inhabitants independently confirmed a visit by helicopter of the late president El Haj Omar Bongo Ondimba in the seventies.

were explicitly not to be engaged with mining. Of course, this did not mean they could not buy gold, or sell on credit with the promise of gold as payment.

In May 2007 and March 2009, the Ministry of Mining visited Ndangui in the context of the SYSMIN project. According to the miners, they were offered motor pumps if they were willing to sell their gold beneath the market price, which they refused. Also, they were pressingly asked to organise themselves into cooperatives. When asked, the miners recapped the notion of cooperatives as explained to them as being against their decades old ways of independent operation as an entrepreneur. Asked why cooperatives threaten such single man operations, the miners said they were told to organise in groups of 10 or more with one boss and employees. All this, selling under the market price and the definition of a cooperative etc., may be a misunderstanding but the fact remains that these are the facts as the miners perceive them.

An undisputed fact is that the Ministry of Mines then and later registered miners by providing them with *cartes d'expart* (see picture in figure 25).²³⁵ The *cartes*, though bearing some similarities and judging by the signature issued by the same person, are quite dissimilar. This, so miners complained, makes it hard for the miners to know if they are issued a real or a false *carte*. If anything, all miners claimed not to have been issued with a proof of payment for the fee paid for the *carte*. Little wonder then that several stories exist of the *cartes* issued being false and a scheme of the civil servant who issued them. The story went as far as claiming a local gendarme at the police post just outside of Lastourville had confiscated some of the *cartes*, stating they were false. If anything, all those interviewed and in possession of a *carte* said local authorities had little to no knowledge of what the *carte* stood for in terms of the rights held by its bearer.



Figure 25: Cartes d'Expart, Ndangui 2007 & 09

²³⁵ As the research team assured the miners anonymity unless explicitly asked permission, reference to the identity of the card holders has been erased.

5.2 Natural characteristics

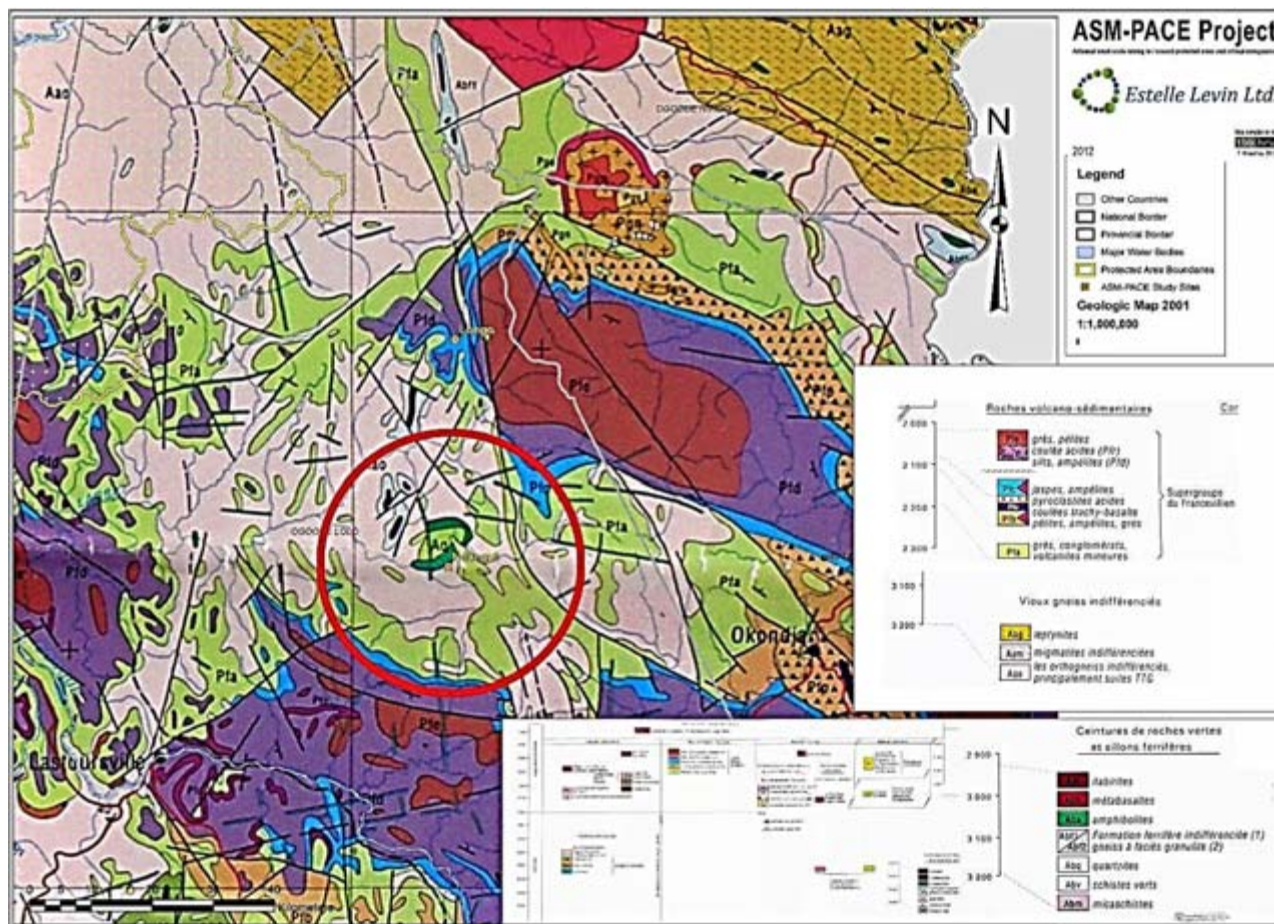


Figure 26: Geologic Map of Ndanguï

5.2.1 Geology

Figure 26 shows an enlarged section of the 1:1.000.000 Geologic Map of Gabon, with Ndanguï in the centre of the red circle.²³⁶ Similar to Minkébé, the oldest rocks are more than 3200 million year old gneisses (pink areas, code Aao). Metamorphosis of these old granites into gneisses in this area has occurred in two phases, first by a magmatic intrusion of granites (red) 2900 million years ago, and later (at about 2300 and 2100 million years ago) through 200 million years of volcano-sedimentary activity (sequence: light green/ Pfa, blue/ Pfc, violet/ Pfd, dark red/ Pfe) in the vicinity. From the first metamorphic phase, small amphibolite greenstone areas (green U shape) and BIF formations (small brown areas surrounded by light blue) remained in place.

The Greenstone/ BIF formations of Ndanguï are significantly smaller than Minkébé. This constitutes no significant limitation to ASM, and eventually even favours artisanal miners, by facing less competition from LSM. In Ndanguï, artisanal miners are extracting shallow placers which accumulated the gold as an alluvial deposit.

5.2.2 Water

The villages of the Ndanguï *regroupement* are elevated. From La Chute onwards, each village is on a higher altitude, Popa being the highest. Streams are consequently located a bit lower, where the ASM sites are.

As can be seen in Figure 26, there are many waterways around Ndanguï, with the larger Ogooue Lolo in the south feeding into the Ogooue river, which flows through Lastourville. In fact, the map shows only the larger waterways. Bountiful smaller creeks feed into these larger waterways, which in the end all feed into the larger rivers meandering through Gabon. Small creeks around Ndanguï were flowing with some speed even though the research took place at the beginning of the wet season. If anything, this indicates an abundance of water, though significantly less in the dry season.

²³⁶ Source Council for Geoscience 2002

5.2.3 Climate

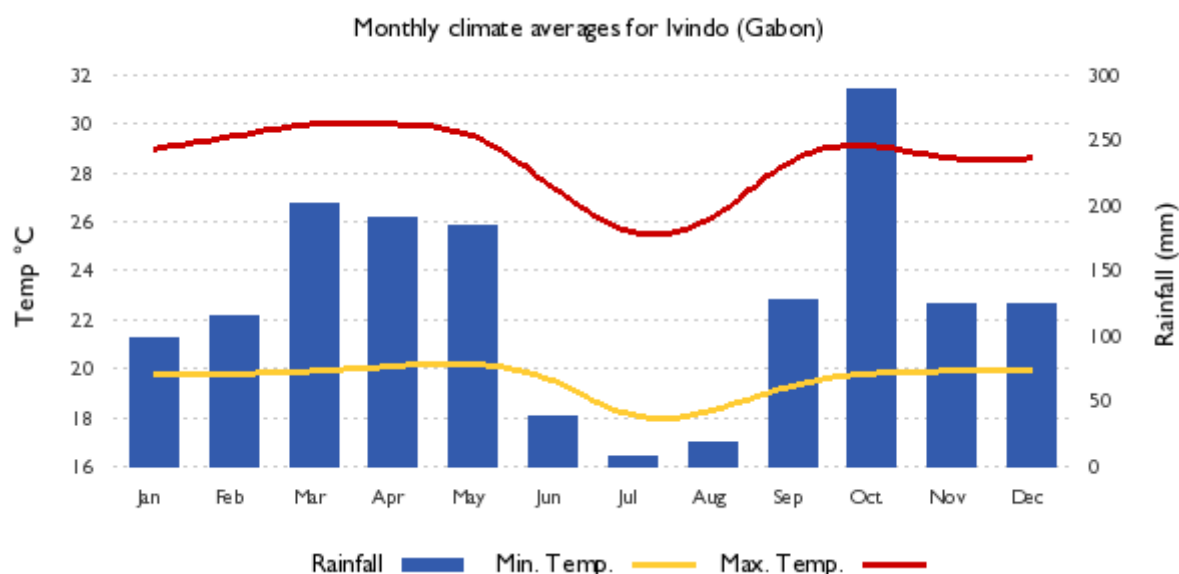


Figure 27: Monthly climate averages in Ivindo, Gabon

The above graph depicts the climate statistics as occurring in Ivindo NP.²³⁷ As exact data for Ndangui are not available, and given the relative short distance (approximately 40km) of Ndangui to Ivindo NP, it is deemed fair to regard these stats to be applicable to Ndangui and Longo, the latter being even closer to the Ivindo NP, i.e. approximately 20km.

The graph indicates two distinct wet seasons, from March to May and from September to November, peaking distinctly in October with nearly 300mm of rainfall. Though December rainfall is as high as November, most of this rainfall occurs in early December, the end of the wet season. The two drier seasons are from June to August, the major dry season, and from December to February, the minor dry season. The majority of the February rainfall falls at the end of February when the wet season recommences. Clearly, the minor dry season comes with an average drop in temperature of more than four degrees Celsius when compared to the peak in March – April. Though only four degrees, the difference feels much bigger due to the accompanying drop in air humidity. To indicate the difference in air humidity, during the first mission, mid-September before the first rainfall, towels used for bathing dried easily. During the second mission, early October, towels hardly dried.

5.2.4 Protected ecosystems

As for all of Gabon’s national parks, Ivindo became a national park in 2002. Ndangui is situated at some 40 kilometres from Ivindo NP, too far to be considered in the buffer zone. Yet, as map 2 in the paragraph on forestry concession depicts, from Ivindo NP onwards there are but forestry concessions. Ndangui is located in the concession of Cora Wood Gabon. This concession has CFAD status (see also report section 3.5 and Annex B for more on sustainable forestry) and can hence be considered a protected area by default. That said, contrary to the official protected areas, people live in these concessions and villages have subsistence user rights when it comes to the natural resources surrounding them. Even so, the villagers cannot do as they please as they are still restricted by the strict hunting laws. Also, their zone is limited to a 5 kilometre radius and the definition of subsistence use of specific natural resources is becoming a bone of contention between conservation, state authorities and the villagers. Artisanal mining is such a bone of contention as, according to the WCS 2010 report, the large ASM pits of Ndangui and most of the smaller ones take place within the zone to which the Ndangui villagers by law have customary user rights. Yet, looking at the desolated, tree cleared areas caused by ASM in Ndangui, whether this falls under what was and is intended by customary user rights is open for serious discussion.

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²³⁷ <http://bioval.jrc.ec.europa.eu/APAAT/pa/3/>

5.2.5 Flora and Fauna

As indicated in the map in Chapter 3, section 3.4 Ndangui is situated in the North-western Congo Lowland Forest eco-region. This eco-region is known to have high wildlife densities, such as the western lowland gorilla, elephant, bongos and chimpanzees. The plant diversity is low in the east, yet higher in the west.²³⁸ As Ndangui is in the west side of the eco-region, it is fair to consider the surroundings of Ndangui as being rich in biodiversity. The richness is confirmed by the findings of WCS, who has executed several missions in the larger surroundings. What is more, in a 2010 report, WCS goes as far as stating that the variety and density of animals found in the forestry concessions south-east of the Ivindo NP (in which Ndangui is located), does not differ from findings within Ivindo NP.²³⁹ Hence, the zone is home to two endangered species (marked red in the adjacent table), three vulnerable species (marked orange), and twelve near threatened / conservation dependent species (marked yellow).²⁴⁰

English Name	Latin Name
Gorilla	Gorilla gorilla
Chimpanzee	Pan troglodytes
Black colobus	Colobus satanas
Common hippopotamus	Hippopotamus amphibious
Golden cat	Profelis aurata
African buffalo	Syncerus caffer
Golden potto or golden angwantibo	Arctocebus aureus
Peters' duiker	Cephalophus callipygus
Bay duiker	Cephalophus dorsalis
White-bellied or gabon duiker	Cephalophus leucogaster
Black-fronted duiker	Cephalophus nigrifrons
Yellow-backed duiker	Cephalophus silvicultor
Crested mangabey	Cercocebus galeritus
Western needle-clawed bushbaby (South	Euoticus elegantulus
Allen's bushbaby or squirrel galago	Galago alleni
Bate's pigmy antelope	Neotragus batesi
Sitatunga	Tragelaphus spekii

Table 12: Endangered, vulnerable species, near-threatened species found within the Ivindo Nation Park area.

To test for density of animal presence, the research team walked a forestry road which is no longer in use. Contrary to requirements by law, the road was not barred, consequently double cab trucks could easily progress on this road until the road ended; a point the team did not encounter after more than 30 minutes walking. From the road, several man made paths went into the forest. Clearly, these were hunting trails. The ease of access and the use thereof, as indicated by the man-made trails, may explain why the team did not encounter animal tracks of, let alone spot, larger or smaller mammals. This is in contrast to the numerous elephant tracks the team observed while driving on certain forestry roads in the area, though at some distance from the villages. Still, without more information it cannot be conclusively said that the absence is due to human pressure or due to the absence of colonies of larger mammals.

In terms of vegetation, judging by the patches of large *parasoliers* (see adjacent picture), a tree which grows only on the fringes of forests or which spawns where forest has been cleared, the surroundings had been subject to either non-sustainable forestry or agriculture. Nonetheless, on the top of the hills in the surroundings the types of trees indicated virgin forest. Hence, the zone is a mix of patches of virgin forest and old secondary forest, subject to rational CFAD extraction and clearance for ASM.

²³⁸ Congo Basin Forest (2005)

²³⁹ WCS (2010)

²⁴⁰ Source <http://bioval.jrc.ec.europa.eu/APAAT/pa/3/>

As primates have a certain preference for secondary forest due to the higher density of fruits, the zone should be an attractive habitat for gorillas and chimpanzees though, as noted, such large mammals were not spotted or heard by the research team. Villagers / miners claimed the absence of such large species in the vicinity of the village. However, information from the villagers on protected species such as the larger mammals cannot be deemed reliable as the villagers know hunting such species is illegal. What is more, the second mission took place outside of the official hunting season. Additionally, one of the research team of WWF, when explaining what WWF was about, handed out the leaflet as depicted in the paragraph on national hunting regulations. This loyal display unfortunately did little to entice the local population to talk openly with the team on matters of hunting and the presence of animals.

5.2.6 Land use

Land use within the larger surroundings of Ndangui is dominated by forestry operations. The active forestry camp related to the concession is however at a large distance from Ndangui, and is accessed through another forestry road, not connected to the road going into regroupement Ndangui up to Popa.

During the first mission, the research team encountered the camp of a geologist from South Africa and his team, researching the potential use of the entire zone for LSM. As is seen on the map in paragraph 3.2.3, Ndangui is covered by the research permit #G7-317 of Ivanhoe Gabon, a subsidiary of the Canada based IvanPlats. As can be expected, the permit is for gold deposits. That said, the region has in the past been researched by the Brazilian mining house Vale for the presence of minable iron ore; findings were negative. Ivanhoe did not respond to phone or e-mail messages to elaborate on their plans for Ndangui. However, the independent geologist working for Ivanhoe did care to share he was moderately optimistic about the gold deposits. Importantly, as confirmed by the Ivanhoe geologist, the deposits eyed by Ivanhoe are not, entirely, the same as the alluvial deposits currently mined by the artisanal miners in Ndangui but rather deeper and also some non-alluvial deposits in the archaic greenstone belts that mark the geology of Ndangui from a gold perspective.



Figure 28: Parasoliers and an isolated virgin tree on the fringes of Ndangui Venez Voir

Agriculture and agroforestry are significant other uses. Respondents indicated that the benefit of planting your own crops started to root. Banana, avocado and mango trees were notoriously present, planted around / near houses. Some of the planted bananas are plantations, though these were usually not randomly planted around the house but rather on plots at some distance to the house or even beyond at 30 minutes to an hour walking from the village. Location of the agricultural plots followed the same logic in that it was something that was becoming more popular, some of it around the houses, yet the bulk, e.g. for peppers, manioc and sweet potatoes, were at some distance from the houses.

Typically agriculture in and around Ndangui involves slash and burn methods. This method involves no other fertilizer than the ash of the burned vegetation. Nor are any other inputs common. As the fertile top soil layer in tropical rainforest zones is typically shallow, agricultural plots run unproductive relatively fast leaving patches of fallow land. By consequence, after use and erosion, fertility is reduced to an all-time low leaving plots bare or overgrown with low brushes only. Bearing this in mind and as fallow lands were not common around Ndangui, it underlines the notion that agriculture in the larger Ndangui zone is relatively new. That said, taking into account that the zones around the houses were covered with relatively low, secondary trees may indicate that agriculture is being re-established rather than new. Indeed, those involved with agriculture were predominantly the older people who had plots at some distance from the village (allegedly to prevent theft). Younger community members of the 25 to 40 age bracket were only starting to pick up on agriculture. This rise is an indication that Ndangui is becoming more and more a village working to increase its autarky levels, or at least working to a lesser dependence from the expensive

'imports' from Lastourville. Building on that logic, agriculture is likely to increase. Indeed, the research team encountered quite some recently cleared, through slash and burn, plots near or even in Ndangui (see picture beneath). For the moment, the fact that vegetables and/ or fruits were hardly found in shops or even in *boites de fortune* (roadside stalls), may also be interpreted as a token that agriculture and agroforestry are largely subsistence oriented for now.



Figure 29: Two dominant land uses: slash & burn agriculture with ASM in the back

Livestock consisted mostly of goats and poultry. Animals did not live on allocated plots but rather roamed relatively free. The forest supplies Ndangui with non-timber forest products for medical and food purposes. Noticeable by the many wooden buildings in the villages, the forests are used for timber extraction. Rather than a saw-mill, there was one carpenter in the zone who made planks out of trees using a chainsaw. Looking at how straight the planks were, and acknowledging how crude a tool a chainsaw is for making planks, one cannot help but be impressed. As far as could be established there was no other use of timber than that for building houses, tools and the odd piece of furniture. Given the length and the quality of the hardwood planks, it seemed that the trees used for the planks were, in legal terms, of sufficient diameter when cut.

Infrastructural uses of land are roads and buildings. Buildings are mostly wooden, with some even having concrete foundations and floors. Those with concrete foundations were built on a bottom ring of cements bricks on to which the wooden plank structure is built. The brick bottom ring means that planks are far above the ground so that they neither exposed to water flooding past and against the house, nor to moisture from the soil itself. This is beneficial as even the hardest of hardwood planks can rot and bend if regularly exposed to moisture. In terms of social indicators, such houses mark a desire to remain in the area for the long-term as otherwise one would not invest in such a relatively expensive structure. Additionally, semi-concrete houses mark the availability of funds to build such constructions stemming either from high incomes or from savings. In turn both are indicators of a long established core population in the villages of Ndangui. Besides the plank buildings, some clay brick houses and even wood / leaf structures were found on the fringes of the three different villages. These houses house the poorest of Ndangui and / or lodgers.

A forestry road connects the three villages of Ndangui with one another. Uphill from La Chute to Venez Voir takes about 5 minutes by off-road vehicle. Another 5 minutes or less with an off-road vehicle brings one to Popa. The road has been built by the forestry company in whose concession Ndangui is situated. When driving from La Chute to Venez Voir, not long after La Chute, one finds another forestry road on the left hand side. Though currently not used, the road is not barred, as it should be according to CFAD standards, to prevent entry into the forest by cars and hence facilitate hunting and, worse, poaching.

Other land use of environmental impact is hunting and fishing. Judging by the fact that the restaurants in Ndangui served defrosted fish, fishing is rare and not commercial. This was confirmed by the miners who explained that good fishing locations were at some distance from Ndangui, which explains why fishing is not popular. Hunting was a different story. We witnessed several people going off in the morning or the end of the afternoon carrying buckshot firearms calibre .12 and during the mission, some cases were found. When asked, these people acknowledged they were going to hunt. In view of the fact that the research team visits to Ndangui were all after the 14th of September, the end of the hunting season according to Article 215 of the Forestry Code, this hunting was illegal. The restaurants in Ndangui did not serve bushmeat though. As some, mostly older and no longer mining but still hunting, villagers

shared with us, hunting is mostly done with snare traps (of which the research team spotted some) and with rifles. Many people had traps in the forests and eating of small bushmeat was regular, though not abundant, or so the villagers suggested. The research team saw little to no public display of bushmeat. The Ivanhoe Gabon geologist explained this absence of public bushmeat display as follows.

He said, in Ndangui, he used to drive a white Toyota Landcruiser for some weeks, before changing it to a Toyota Hilux double cab truck. He never saw bushmeat until he changed the cars. All of a sudden he noticed the people, alongside the road who used to stand still when he passed with his car, continued walking with bushmeat in their hands. He saw too bushmeat along-side the road in stalls. His explanation was that conservation organisations in Gabon, including the ANPN, tend to drive white Toyota Landcruisers, as the villagers know since they had been visited by such organisations on several occasions. Hence, as soon as the population sees a Landcruiser, they hide the bushmeat.

Since freezers and refrigerators are quite common in Ndangui, bushmeat can be stored so the meat does not need to be smoked or otherwise be prepared when caught. This is an essential element in hunting pressure. Still, hunting appeared commercial only in that there was one dedicated hunter who visited in a village just before La Chute. He visited time and again to sell meat to locals. Random checking by the research team of the coolers on transport to Lastourville and the coolers in shops, did not reveal large quantities of bushmeat; another indication that the villagers are involved in subsistence hunting only.

Mining is a visually dominant form of land use. From La Chute to Venez Voir was a large field with several pits. The field was roughly 0.5 square kilometres (see picture beneath). It was an old site as vegetation was slowly regenerating. Notably, one saw palms and banana plants; not quite the tropical rainforest species. At the high end of Popa, where the road came to a stop, another large mining pit existed. Though some miners still worked the fringes, creating straight up pit walls of seven meters and more, these were exceptions. Most miners, from all three villages, had their pits in the forests. Given the time and the resources available to the research team it is impossible to make even an estimate of the amount of pits in the forest.

5.3 Social characteristics

5.3.1 Main livelihoods and incomes

In terms of alternative livelihoods, the research found what mostly seems to be subsistence oriented agroforestry / agriculture around and near the houses. As mentioned, mostly older people have agricultural plots on some distance, at one to five kilometres from the villages. These plots are somewhat more commercially oriented. By what the research team could establish, agriculture, even commercial, is on the rise.

People rent out rooms and even houses to people new to the zone and looking for gold. It transpired that savings from mining income are built brick by brick in the form of houses both in Ndangui and outside. If not in Ndangui, houses are built for family, such as parents and spouses with children, living in Lastourville, Koulamatou, or villages of origin in cases where people were not from Ndangui. Once parents and spouse have a roof, a new house is built to rent out. While not many could claim to have reached that stage, it was confirmed that this was the way to save. Banks, a social savings plan (as exists in Gabon), and other institutional saving schemes were not used. The basic reason for this informal saving plan is that people cannot secure bank product or open an account with the National Register for Social Services as the occupation of 'artisanal miner' is not registered nor otherwise recognised as a profession. What is more, even miners in possession of a valid *carte d'expert* cannot list "artisanal miner" as profession on their identity papers and, hence, invent professions.



Figure 30: Old mining pit between La Chute and Venez-Voir

Shops and restaurants are run by foreigners, West Africans, who are generically referred to as *les Maliens* (Maliens). As previously mentioned, it was the *chef de regroupement* who invited the foreigners to run the shops and restaurants after the period of Mr Gilbert had come to an end. Shopkeepers in Ndangui did not answer whether they bought gold or not. Miners, however, did mention they sometimes paid with gold. Also, two shopkeepers in Lastourville mentioned to have ‘a brother in Ndangui’ to buy gold. With the gold and looking at the price difference of goods sold in Ndangui and those in Lastourville, one would be inclined to think the shopkeepers make solid profits by selling groceries, clothes and even tools. While shopkeepers were not eager to share income profiles, in determining profits one has to bear in mind that there are numerous shopkeepers and customers are limited.

Added to the high “shopkeeper : customer” ratio in Ndangui pressuring income for shopkeepers, the transport of goods from Lastourville to Ndangui is quite costly. Linked to one or two of the shopkeepers, transporters run two “to and fro” shifts per day driving a single cabin truck such the Toyota HiLux and the Mazda BT50. As on Friday evenings there is quite some social traffic between the villages in the *regroupement*, in the wider Ndangui zone, and even to Lastourville, some transporters run extra shifts on those nights.

Though transporters did not wish to share information on their income, an estimate of incomes was made. The research team assessed the loads of the single cabs as they left Ndangui La Chute for Lastourville at which point the single cabs were at their fullest since La Chute is the last stop in the *regroupement*. In an attempt to determine the value of the load using the prices as they were shared with us by the miners and shopkeepers, an educated estimation of one load comes to between 50.000 and 100.000XAF, or €75 & €150. As the single cabs make two full runs a day, two times to Ndangui and two times back to Lastourville, a full day’s income for transporters is between 200.000 and 400.000 XAF, or €300 and €600. If a transporter would replace his vehicle once a year, and further costs being the driver’s wage and gasoline, the profits are still remarkable, particularly for Gabonese terms. Moreover, the profits are well beyond what the average miner or shopkeeper earns.

One more venue for additional income in Ndangui is bar-dancing. As the West Africans in Ndangui are all Muslims for whom alcohol consumption is forbidden, the bars are run by Gabonese. All bar owners the research engaged with proved to be from the village and they proved to be miners. Lastly, there is a range of services which are exchanged for money or for counter services such as hairdressing, making pictures and printing these (with a portable printer!), taking thing to the next village, etc. There is one exception to this: the carpenter cum lumberjack. There is one carpenter in Ndangui who cuts trees into planks and who builds sheds and houses. He preferred this to mining, yet he did still turn to mining every now and then when demand for his services was low.

5.3.2 Organisation & nature of non-ASM activities

In the area Ndangui *regroupement*, every village has a chief and some sous-chefs. The chiefs are appointed by the Prefect of Mouloundou and the Sub-Prefect of the District of Ndangui by suggestion of the Head of Canton. The term of office is apparently indefinite. These various chiefdoms control land management, and represent the people

involved in the settlement of internal conflicts between community members. In La Chute the chief's rule was mostly ceremonial. The village was dominated by young men and some elders. Among the miners, as appeared during a session with the miners, two young men were respected as de facto representatives. La Chute had a very open atmosphere in which miners and shopkeepers mingled.

In Venez-Voir, the chief and his notables were the clear council of power to which outsiders needed to refer. Their reign was not appreciated by all members as became clear when speaking to villagers. One of the villagers had the backbone to speak out on what he felt was a repressive regime which did not have the interest of all in the community at heart. After several remarks to that extent, the chief broke out in a tirade, referring to his efforts in opening the zone for mining, and asked if anyone was forcing the speaker to stay in the village. Mostly, this showed a disgruntlement regarding the services in the village and while the chief would recognise the need for improvement, he pointed out that it was not in his power to change these things other than reporting to the *chef de canton*. Regardless of the qualities of the chief's government, given the organisation of government in Gabon, it is indeed difficult for a chief to change the service level in their village as these services are provided by and are under tutelage of the relevant ministries. So, for things to change, say improved health care, the chief would need to get the request all the way up to the president via all sub-levels of administration. In the unlikely case it arrives at the presidency, the president can then address the situation with the ministry. This logic of government points out just how valuable a visit by the president to any city or village is.

Whatever the logic of administration, the villagers did not succeed in overcoming the shortfalls of the government by organising themselves, be it in saving groups, be it in cooperatives. Of all the Ndangui villages, Venez Voir left the most un-cohesive impression. Indeed, Popa seemed to be a bit of the opposite. There the chiefdom structure worked in practice, and sous chef seemed more than just ceremonial. The chief was quite a bit younger than was the chief of Venez Voir. Houses were built substantially closer to one another than in any of the other villages, which can be interpreted as a sign of increased cohesion. Though saving schemes and the likes were absent in Popa as in the other villages, more agriculture and poultry, an operational common shelter, houses in good condition, etc. gave an impression of a community which was more tight-knit than the other two villages.²⁴¹ Also, the chief kept a list of the people living in the area, making a particular effort to list foreigners who had to submit copies of their identity papers and a recent photo. Inquiring why the cohesion in Popa seemed so different from the other two villages, more than once people explained it with reference to the fact that the broad majority of inhabitants in Popa were of the Kota ethnicity, an ethnicity who has lived in the region ever since there were people. Not only, did the shared ethnicity add to the cohesion, Kota, so they claimed, are by culture more organised.

5.3.3 Socio-cultural diversity

The population of Ndangui is for the largest part composed of Gabonese ethnicities namely the Kota, Massango, Adouma, Punu, Bahumbu, Pouvi, Nzebi and Fang. In Popa few foreign miners were said to be active, so the shopkeepers and their families constituted the majority of foreigners. The team found nationals from Nigeria, Mali, Cameroon, Senegal and the Democratic Republic of Congo.

In terms of religion, shopkeepers are West African Muslims and Gabonese Christians. Church services are held in Venez Voir and Popa.

5.3.4 Living conditions

Ndangui is functioning as a village. In many ways it is better equipped than are many other villages in Gabon with the constant traffic of transporters and the well-stocked shops, the bars and restaurants and even agriculture and livestock. As most of the houses were solid wooden constructions with corrugated iron roofs, housing was well taken care of as well. Crime was said to be very low. Even during the weekends when young miners drank heavily in La Chute, the research team witnessed no aggression.

Women perform the typical chores of the home such as, tending to small children, laundry, cooking etc. Also, some women are engaged in agriculture. Men work as miners. As far as we could verify, shops are owned and run by West African men.

The 600 people living in the entire *regroupement* lived with space to spare. As Ndangui is recognised by the administration as a village, villagers have rights to use the forest and to mine. This allows them to invest in their lives

²⁴¹ This is not to say there were no disputes. When after the focus group with women, the FG leader offered drinks, the one half wanted to take the drinks from one shop and the others of another. They refused to back down and split shopping was needed to keep the peace.

and their surroundings. However, the villages do not succeed in mobilising social capital to as a community engage in improving living conditions. Villagers' support others financially when people are ill or, worse, die, yet saving groups and cooperatives do not exist nor have they ever. In conversations on cooperatives, it remained unclear whether the concept was really known in its original concept. What they knew was how they had understood the concept as explained by SAT, and they did not appreciate that as it implied a boss and employees. What is more, a cooperative, as it is now phrased in the Gabonese law, invites the government in as an arbitrator and as a controlling element. Such control is the last thing the miners want as they strongly appreciate their independence. Indeed, independence is sternly present value with the miners. More broadly shared values, i.e. including those expressed by women, are said to be hospitality, solidarity, integration and distrust of miners vis-à-vis certain visitors.

The distrust of miners seems to contradict hospitality as a value, yet the nuance lies in the fact that in Ndangui people have grown distrustful of government officials and politicians in the zone. Given that no one has explained to the miners what the consequences may be when or if a large scale mine will be established in the zone, anyone perceived to represent a large-scale mine is distrusted as well. In this regard, it did not help that the geologist hardly spoke a word of French.

However, distrust, as it was said in one-on-one conversations, was not limited to strangers. As said, communal action suffered from lacking levels of trust. In all, the now minimal communal efforts concentrated on:

- road maintenance,
- technical assistance among miners,
- assistance in case of death, illness and accidents through in-kind contributions (food, drink) or money

In terms of aspirations, indicating what the people felt was missing, these revolved around:

- improvement of access roads,
- tools for gold mining,
- supply of drinking water through rural water supply schemes,
- strengthening the health clinic and the one person staff thereof,
- an additional primary school teacher,
- better regulation of gold mining in that their rights needed to be strengthened in the face of all types of government official visiting the zone and extorting gold,
- electricity in the villages,
- coverage for the mobile phone network which is now restricted to the highest point in Popa, and even there it is faulty at best,
- The purchase of planks, at a discount preferably, with the forestry company in the construction of forest habitat.

The latter is particularly interesting as it seems to indicate miners do not use other timber than that supplied by 'their' carpenter. Those had to be paid for as well. Apparently, miners are under the impression that the forestry company could undercut the prices of the carpenter. As the sawing mills are in Libreville, this is unlikely.

5.3.5 Health and security

In Ndangui a serious injury in the village, e.g. bodily harm due to the pick-axe or the shovel, was said to occur no more than once every three months. ASM related fatal accidents, mostly due to the collapse of a pit wall, were said to transpire on average once every six months. However, the Ivanhoe Gabon geologist claimed that two fatal accidents had occurred during his engagement of two months in the area. It was impossible to verify these figures with the health station in Ndangui as the government appointed doctor of the *regroupement* was usually unavailable. Furthermore, the pharmacy was insufficiently supplied and lacking even basic painkillers.

Next to ASM related health issues, there are the typical sicknesses one can encounter generally around Gabon; with the changing of the seasons 4 times a year, flu viruses are all but inescapable. Some of these viruses have symptoms not unlike malaria, though in the end they are not as severe as malaria. Still, malaria is prevalent, with that note that mosquitoes are almost nonexistent during the latter part of the long dry season; from late June to late September.

5.3.6 Education and skills

The large majority of the people had not received a tertiary education while a smaller majority had not finished secondary education. A kindergarten and primary school are run by one teacher who doubles as principal. Books are present in sufficient stock. The principal also caters for older children who would otherwise not go to school or who have yet to master some elements of primary education such as reading, writing and simple mathematics. At the time of research, children as old as 16 were attending classes. Still, most miners had wives and children living in

Lastourville or Koulamatou for the simple reason that schooling opportunities were better there. That and the fact that life was cheaper in town.

5.4 ASM in Ndangui

5.4.1 Organisation of mining activities

In Ndangui mining is done by the men. During the school holidays, children and women assist, e.g. by sifting the sand. In those holiday seasons people in family units, if they have family that is. Still, even with family, the miners need to fall back on purposefully created teams to do the heavy digging so that the family can sift. If people are asked for support in mining, they are paid with food, drinks and meat. Also, one would return the favour. If, however, people work in a team throughout the process, the winnings are shared equally. Such teams tend to consist of three men.



Figure 31: Mining techniques in use in Ndangui, Gabon

5.4.2 Mining techniques

Miners tend not to yield every day. Rather they work a plot clearing the land and digging the ground which they hope contains gold. After working the ground for several days, they commence sifting the mud using sluices. Water comes from rivers, either directly or through using motor pumps and pipes or hoses. The residue that sinks to the sluice bottom is then once more panned to concentrate the gold. After this, miners further separate the gold from the remaining dust by carefully blowing the concentrate. The adjacent pictures demonstrate the techniques.

5.4.3 Production

In Ndangui, a bad day meant a production of 1 gram, an average day produced 3 grams and a good day 5 gram; or so claimed the miners when asked. The impression arose that miners are either reluctant to speak of average production, or they simply do not think in terms of typical daily production. The latter as they go from day to day, sometimes waiting two weeks before they concentrate their findings into gold. Interestingly, the younger miners in La Chute often boasted to us they had found large nuggets. If the spending of the young miners on a Friday night was anything to go by, they must have earned considerably for Gabonese standards as those, roughly, ten miners research members socialised with easily spent over 30,000 XAF or more.

At the time of research, in Lastourville, one gram of gold from Ndangui traded at 19000 XAF, or 29 Euro, Interestingly, buyers in Lastourville on average considered the quality of gold from Longo to be slightly better than that of Longo which traded at 20,000 XAF. Looking at the gold spot price at the time of research, being on average 39 Euro, there is only a relatively small difference of roughly 9 Euro between the price the miners get for their run of mill in Lastourville and what a refined gram of gold would sell for on the international market.²⁴²

5.4.4 Key stakeholders

Between the villages, there is a cohesion that is characterised by the mobility of miners from one site to another for shopping, for mining, leisure, family visits, assistance during birth, traditional ceremonies and mourning in death cases. Also, the mobilisation for road maintenance in case of necessity involves residents of all villages.

In total 16 stakeholders were identified in the focus groups. Note that different stakeholder roles may come together in one person, e.g. a miner hunting on the side, or a woman managing the household who also works an agricultural plot. The key stakeholders are the following:

1. Miners
2. Farmers
3. Women managing the household
4. Transporters
5. Shopkeepers
6. Hunters
7. Ministry of Education
8. Ministry of Mines
9. Ministry of Trade
10. Ministry of Health
11. Ministry of Defence (for the police)
12. Local administration (Prefet, Chef de Canton, Governor, etc.)
13. Forestry companies
14. Elected officials
15. Political parties
16. Gold buyers

Interestingly, the Ministry of Water & Forests was not at all mentioned, and even declined as an option when suggested to the miners.

Relationships are generally good between local actors and others, including with the gold buyers. Yet conflict, or better, a negative appreciation of the relations, exists between local actors and some external actors, namely:

- government actors (for the lack of support on mining, for the lack of drug supplies in the dispensary, etc)
- transporters with respect to the very high costs of transport.

5.5 Environmental Impacts

The impact of motor pumps is impressive. This is best seen on the bed of the valley running through Popa. As the slopes and the valley indicate, a stream used to flow through the valley. That stream currently is no longer visible. Admittedly, even the second mission took place only in the early stages of the rainy season. Still, the valley is now considerably less deep than it used to be and it consists of a wide surface of mud on which nothing grows. Moreover, the residue mud washed down due to motor pump use covered existing vegetation as can be seen on the adjacent photo showing a palm tree buried under metres of mud. Still, as the two large pits are not deep, the impact on

²⁴² <http://www.goldprice.org/spot-gold.html>

groundwater levels seems limited. If anything the mud levels demonstrate a complete absence of tailings management. Indeed, as the soils around the pit are clay soil, they are conducive to erosion. A deep pit caving in on miners, due to the fragility of the soil, is the number one cause of fatal accidents in Ndangui.

A diversion of the waterways to support mining activity was noted. Furthermore, sediment deposition of in the river led to significantly changes of the water turbidity and traces of petrol spills in waterways were found.

Though bushmeat consumption occurs, and even as hunting seasons seem not to be respected, hunting impact seems to be low; not higher than in any other village in Gabon. Hunting pressure seems not to extend beyond the carrying capacity of the environment. Indeed, as a WCS report states, impacts are mild as the zone is not overpopulated since ASM practices are not (semi)industrialised. This actually goes for impacts on biodiversity as a whole. There was no indication of large scale commercial hunting, let alone ivory poaching.

As the large pits indicate, excavation activities come with the clearing of forests. The pits in the forests are, for as far as the research team could establish, not as large as those adjacent to the villages. Clearance of lands also occurs through slash and burn methods for agriculture. By what could be established, most plots had cleared young secondary forest near the roads and houses. As dictated by the climate, when no longer in use, the pits are gradually taken over by vegetation.

Finally, waste management is somewhat controlled in that waste dumps are somewhat centralised. Once piles grow too large or too smelly for comfort, they are covered with sand and left there.



Figure 32: Palm tree buried in the mud of the large pit bordering Popa

6. CASE STUDY: LONGO

Longo is a reopened mining zone in the Ogooué Lolo province of approximately 15 to 20 metres long. It is named after the principal waterway running through it. Longo is marked by several mining camps:

1. Mitounga
2. Ville Mehanwou
3. Ville Saleyong
4. Ville Niabe
5. Bossokobenga
6. Abondjé
7. Afrique du Sud
8. Otounga
9. Songa

Only the first four settlements were occupied and active during the research missions. The other camps, small settlements of a few houses made of clay/wood/leaves, were not populated at the time of research though some were populated during a mission of WCS some three months previous to the ASM –PACE research as in June women, children and students arrive for the summer break.²⁴³ At that period the miners go to their pits in the more distant camps to regroup and stick together once the women leave after the school break.

The ASM-PACE project was recommended to research this site by the ANPN in July 2011 as it was said to house over 600 miners with more dripping in as the Minkébé mining zone, north of Longo, had just been closed. The fear for an influx was based on the fact that Gabonese miners from both Longo and Minkébé have roots in the region around Makokou. The ANPN most likely based its information on a reading of the report of the previously mentioned WCS mission in late June 2011. A paragraph of the report read:

“The finding is the zone could know a rapid demographic growth because of the very strong human concentration in the Ndangui site south of the research zone, of which the population is estimated to be near to 600 persons and, most of all, because of the recent closure of the artisanal mining site Minkébé...”²⁴⁴

A quick reader would be forgiven to think that the population of 600 referred to Longo rather than to Ndangui, as the research team found.

6.1 History

The Longo mining site was opened in 1952 by a French explorer, then consisting of Ville Meyong and Ville Saleyong. Like other French explorers, he left after independence. After Gabon's independence in 1960, mine operators of foreign origin had no right to exploit the traditional gold mines throughout the territory of Gabon. The site was then claimed by national miners in search of livelihoods. Two of the current leading miners, operating as de facto chiefs of the two biggest settlements in the zone, descend from allegedly leading miners from the 1960s. In the 1980s, Longo benefited from the operations of Mr Gilbert. Hence, even Longo had a helipad to allow for the coming and going of Mr Gilbert. Claims that this had even happened by plane, as made by the WCS 2011 report, could not be substantiated as we found no tracks of a runway, not even overgrown tracks. What is more, those respondents who provided the most consistent information and who had verifiable claims to being highly knowledgeable all denied planes had ever visited the zone.

During the Mr Gilbert days, so it is claimed by descendants, over 600 miners and their families lived in the zone. Like in Ndangui, this was due to the attractiveness of the improved living conditions, e.g. steady supply of food, tools and sundries. For, under tutelage of the Minister of Mines, Mr Gilbert had built supply stores selling groceries and all needed supplies. In return the miners sold all their gold to Mr Gilbert. The direct link between population numbers and the presence of the services of Mr Gilbert's outfit is underlined by the fact that Longo was all but deserted after Gilbert left. When it became apparent that neither Mr Gilbert nor his services would return, women and children started leaving the zone. When in the early 1990's the ASM Minkébé zone reopened after Mr Roux had left after independence, Longo miners moved north to mine in the Minkébé region. Reasons given were the relatively better supply of food and word that gold findings were easier and larger in the Minkébé zone.

²⁴³ WCS 2011

²⁴⁴ WCS 2011

The site all but deserted, in 2006, the two above-mentioned descendants of the original miners returned to try their luck. With their findings, by invitation or by word of mouth, more miners came dripping into the area. In September 2011, upon the arrival of the research team, this population totalled roughly 50 people. This is consistent with the findings of the WCS 2011 mission, who found 78 people present in the zone in June, including women and children. During the first mission halfway September, many woman and children had already left as schools were about to start. Upon return in Longo in October, of the woman and children, only the mother in law of the Matounga chief, a young woman with her young child, and the mother of the Ville Mayong chief were left in the zone.

6.2 Natural characteristics

6.2.1 Geology

The oldest rocks in Longo are more than 3200 million year old gneisses (pink areas, code Aao), metamorphosed by magmatic intrusion of granites (red) 2900 million years ago, and later volcano-sedimentary activity (at about 2300 and 2100 million years ago). Different to Minkébé and Ndangui, the mineralization might be related with the later volcano-sedimentary activity (sequence: light green/ Pfa, blue/ Pfc, violet/ Pfd, dark red/ Pfe). However, some 10 km south of Longo, old BIF formations (small brown areas surrounded by light blue) are outcropping.

As it stands, without more detailed fieldwork, for the moment it remains unclear whether the gold in Longo originates from the later volcano-sedimentary era or from the earlier greenstone/ BIF era, the origin of gold deposit is difficult to assess. Artisanal miners are, similar as in Ndangui, extracting a shallow alluvial placer deposit.

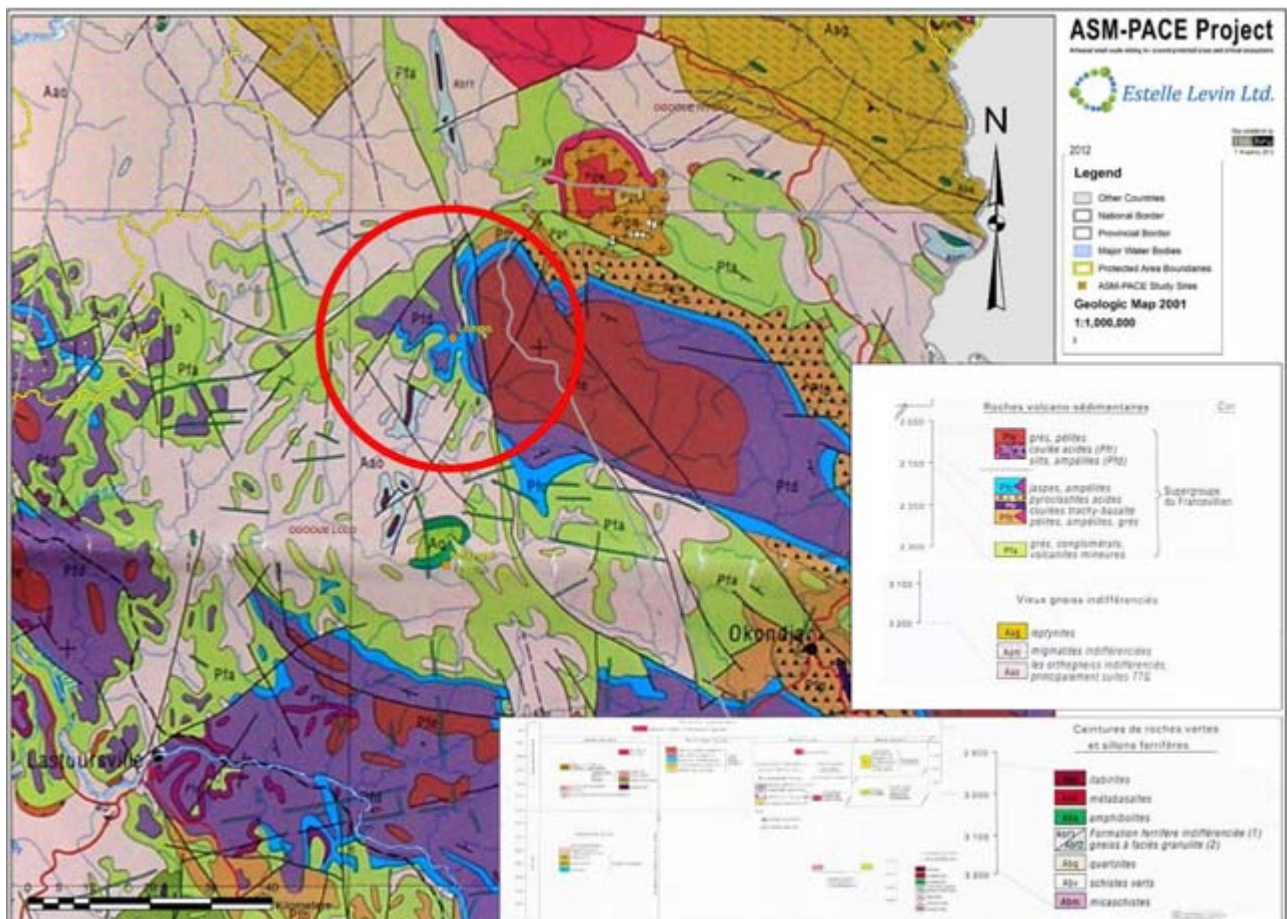


Figure 33: Shows an enlarged section of the 1:1.000.000 Geologic Map of Gabon, with Longo in the centre of the red circle. Map by F. Hruschka

6.2.2 Water

Longo is elevated and rich in waterways, streams, creeks, ponds etc. The Longo River is the largest waterway meandering through the zone. Streams used for mining and feeding into the Longo are the Komba, Abondjé and the Métonga. Most of the camps can be found along the flow of the river Longo. A large part of the area's waterways are feeding the Lassio River, south of Longo. The northern part of the zone feeds into the Dji-Dji river.

6.2.3 Climate

Climate figures are the same as those found in Ndangui.

6.2.4 Protected ecosystems

Longo's camps, as can be seen in the adjacent figure, are located some 20 to 25 kilometres south east of Ivindo NP. Also, it lies, for the larger part, in the logging concession of the *Société Equatoriale d'Exploitation du Forêt* (SEEF). Furthermore, Longo is partially located in the Dji-Dji watershed. As the Dji-Dji is one of the main rivers running through Ivindo NP, the watershed area of the Dji-Dji is crucial for the existence of the dense forests in the park. Pollution or other impacts of the Dji-Dji through artisanal mining directly affect the integrity of the Ivindo NP.

6.2.5 Flora and Fauna

Flora and Fauna details are equal to that of Ndangui. Contrary to in Ndangui, the research team can vouch for the presence of some of these animals in the Longo zone as the team encountered only hours old tracks of elephants, gorillas, duikers and forest buffalos. Additionally, a group of chimpanzees was seen and predominantly heard when they fled due to our arrival. Furthermore, the distinct call from the Callao bird was common. Whatever it was sniffing and growling around the tents at night remains unknown.

6.2.6 Land use

Though several anti-poaching missions found hunting activity in and around Longo, the findings do not suggest commercial meat hunting.²⁴⁵ This may be explained by the fact that little cooling capacity is available in the camp while transport to Lastourville is limited and controlled. Nonetheless, a November 2010 anti-poaching mission found not only the carcass of an elephant, but the meat and the ivory as well. The same mission found the skin of a leopard in one of the huts. These animals are fully protected under Gabonese law which means that hunting, trade and even transporting them is prohibited throughout the year. Both instances were near Matounga camp. A later mission, late May early June 2011, anew found ivory.²⁴⁶ Though finding snare wire traps in the hunting off-season, a recent mission in November 2011 no longer found traces of poaching for commercial non-meat related purposes in Longo. It is unclear to what extent the veritable miners are involved in the hunting though miners are known to hunt through snares and some even using a buckshot rifle for which a permit is required. Illegal rifles have been confiscated by local agents of the Ministry of Water and Forests, so stated the deputy conservator of Ivindo NP, who joined the research team for the first mission to Longo.

Land use for agriculture is limited and nascent due to low population pressure. Yet, as the chief of Matounga and his wife are well aware of the potential profits involved selling agricultural and livestock products to miners, this practice may well increase in the near future. The fact that extra grounds were already cleared for more agriculture while the existing crops had not yet matured is a strong indication thereof.

Industrial uses of the zone are logging and, potentially,



²⁴⁵ LAB / WCS reports

²⁴⁶ LAB Compte rendu, June 2011

Large Scale Mining. LSM is likely as the zone is being prospected by GoldStone Ltd Gabon, prospecting permit G2-320. Goldstone is currently in the process of building a field camp in the zone. Combined with the news that Minkébé camps were evicted, and the rumour that this is done to serve the LSM project of Belinga, the presence of LSM prospecting makes miners somewhat uncomfortable about their future.

6.3 Social characteristics

6.3.1 Main livelihoods and incomes

Four traders were identified, three woman, all in Matounga. Only one of them had a something that closely resembled a shop; the wife of the chief of Matounga (see picture). One of the traders left the zone shortly after the research and has since moved to Libreville as *'life is too hard and business too slow'* in Longo. Analysing the adjacent picture, one better appreciates that remark. Clearly visible is the exceptionally limited stock available. From what is available the largest stock in that of champagne bottles; the golden necked bottles in the midst of the picture. Surely a rare find in artisanal mining camps around the world and particularly in one as remote as Longo. The research team was generously offered a bottle. At the second visit, only two weeks later, the bottles were finished. Empty beer bottles on the floor and the two mauve bricks of wine (next to the role of white tape) further indicate a significant alcohol intake by the young miners in Matounga. It was said that drinking took place in weekends only and that alcohol was forbidden in the pits.

Indeed, the other traders sold large amounts of beer and spirits as well. A pallet of 24 large cans (0,5 litre) of Dutch Royal Beer was said to set a miner back 1 gram of gold, which was trading at 20,000 CFCA at the time of research. This is about double the price paid for this in Libreville. Other than alcohol, the stock in Longo consists of minor things, predominantly related to cooking, such as tomato paste, flower, rice, cooking oil, powdered milk and canned sardines.



Figure 34: Baking bread in Ville Meyong, Longo

Contrary to what one may be inclined to think, this narrow variety is not so much explained by on site agriculture or livestock, or at least not in Matounga. Besides some poultry, livestock was not encountered. Agriculture, or agroforestry, is in the process of being developed; a small plot of approximately 20x8 meter behind the premises of the chief is being cultivated by the chief's wife and her mother. Opposite of the premises some more land is cleared for the same purposes. Ville Meyong, being one of the three oldest sites, has more agriculture and agroforestry. Most of these are left over from days gone by; planted trees standing around Ville Meyong confirm Ville Meyong as a site active decades ago. Such trees and crops are also found in the other old sites, e.g. manioc, bananas, mango and even cassava from which flour is made to bake bread (see picture).

One other livelihood, or better additional incomes that no one earns a full living out of, is transportation of goods for



Figure 35: Transportation logic Longo

the traders. As said, Longo is not directly accessible by road or waterway. SEEF, the logging concession holder in whose concession Longo is largely situated, hauls the miners per previous announcement, once every three weeks to the nearest train station, Milolé. This transport is per sand-truck (see picture), nicknamed *le bain* (the bathtub) for obvious reasons. Goods ordered by miners arrive by train. Likewise, by car, miners have goods from Lastourville delivered at the announced date. All the goods will be transported back with the miners in the sand truck up to the *pointe terminal*, the end of the road, at which point SEEF has built a shed for the miners in which they can shelter as well as store their goods (see pictures). This is necessary as the end of the road is not in Longo but rather some 30-45 minutes walking to Matounga over a two times up two times downhill trail. From Matounga it takes another 90 minutes to come to Ville Meyong on an uphill trail (the other way around takes half the time). From Ville Meyong different trails lead to different camps of which Saleyong is the closest at about 20 minutes. Given this challenging access, all goods have to be carried into Longo. Hence the need to stock the goods in the shed made by SEEF. To the north, there is a footpath between the site and the village Ville Mehanwou Indombo, a 3 day walking trail to be precise. From this footpath the miners get supplies of goods from Makokou surroundings.

Young miners who are familiar with the trails and who are quite strong earn an extra by carrying goods for others, making several to and froes. Another extra income source is lodging. The Matounga chief has built a wooden structure with several small rooms in Matounga. These rooms are rented out to young miners. As can be expected in the forest, hunting is a livelihood, though professional hunters were not thought to be present. Next to hunting, fishing is actively pursued mostly through using fish traps.

6.3.2 Organisation and nature of non-ASM activities

In terms of population, in Longo, Matounga camp was by far the most populated site. Most populated site is a strictly relative concept here as during our first mission, by own count and through verification with camp leaders, the research team estimated the total population of the zone to be 48 people, including some very young children and women. As the schools started the new school year between our two missions, during our second visit the population had further decreased as some women with their small children and some students had left the mining camps. Though individual foreigners had been present in Longo, there were none present at the time of our research.

Population figures in Longo swell seasonally during the school breaks when wives and children join the men in Longo. Other seasonal inhabitants are students. While most are directly or indirectly related to the miners present, students, like proper miners, do come to the camp simply by having heard of it and looking for additional income. Seasonal or non-seasonal, official numbers cannot be obtained as Longo is not an official administrative unit and is hence not included in any official census.

Longo has no official administrative status. All camps, no matter how old, lack legal status. The chief of Matounga seems to be on a mission to get official status. At one point, a couple of months before the research, the Matounga chief visited the governor, requesting him to assess the Longo situation and to judge whether Longo merited administrative status. In response, the sub-prefect was to visit Matounga. Matounga miners prepared for the visit, making sure the prefect would be treated to food and drinks worthy of his position. In their best attire, food prepared and all, the Matounga chief and his miners awaited the arrival of the sub-prefect. The sub prefect never showed up. Miners were told the sub-prefect had been near, but could not arrive in Matounga as the key to the lock holding the chain barring the road to Matounga could not be found. Given the investments made, the chief asked SEEF to reimburse them as it was SEEF's fault. SEEF has refused and relations between the Matounga chief and SEEF went from strained to conflict from there.

The reason for the sub-prefect not arriving is a bit quizzing as the chain is only loosely secured to a tree. If the will is there, anyone with as much as a pocket knife could have unsecured the chain thus granting access to the sub-prefect.

Back to the ambitions of the Mitounga chief who claims valid altruistic motives for official administrative status, such as that people could vote at SEEF rather than having to go to Lastourville, they would have claims to government services such as health care and schooling, etc. Yet, as the chief would logically be the government-appointed chief, an official status would also significantly add to the status and power of the chief of Matounga. Note that he was not trying for Matounga, but rather for the entire Longo zone, thus extending his power to camps currently outside of his realm of influence. Indeed, the chief of Ville Meyong is not included in the efforts for official status.

At the time of research the Longo zone has basically three operational camps. As one of the three only had 2 inhabitants left, it is fair to say that at the time of research Longo consisted of two active camps. The two active camps are the largest camps Ville Meyong and Mitounga. The smaller camps are populated during school-breaks when temporary labour comes into the camps. Also, some miners indicated to be on the brink of more permanently

establishing themselves in at their pits near / in the smaller camps once they had enough money to buy motor pumps and hoses.

As churches and social infrastructure is as good as absent, there are few other activities to speak of but for those of the other livelihoods, which are described in the paragraph in livelihoods.

The miners are not organised in cooperatives yet communal efforts occur albeit limited:

- Cleaning of the zone of waste
- Digging canals
- Financial and in kind support for the sick

Underpinning the community, the miners saw the following values as central to their behaviour:

- Prevention of accidents
- Being responsible with alcohol
- Against violence
- Hospitality, even to newcomers arriving without tools
- Equitable sharing of profits when working in teams, even if not all tasks are equally demanding
- Solidarity
- People with a mining history in Longo, directly or as descendant, are considered family

6.3.3 Socio-cultural diversity

As there are hardly any people in Longo and the vast majority of the town's residents are men (96 per cent Gabonese men and 4 per cent of Gabonese women). The only observation on diversity is that the people in the Matounga camps are linked to Lastourville or Libreville; the latter using the train from Mikolé station. The camps north of Mitounga are more linked to the Makokou region. If former miners of Minkébé were to come to the region, they will likely establish themselves in these camps, starting with Ville Meyong.

6.3.4 Living conditions

Living conditions in Longo are not easy. There is no infrastructure to speak of and all transport is by foot. From Matounga it takes 30-45 minutes to arrive at the collection point of *le bain* (see also paragraph on living conditions). Yet, from there one needs to walk for another 30-45 minutes before the forestry road is reached, the entrance from the forestry road to the collection point is barred with a chain, the lock of which can only be opened by SEEF. Hence, no other vehicles can reach the collection point. As one woman in Longo put it:

“for a young woman here, when you get off the train you're beautiful; while you're in Longo your looks go; and when you get back to Libreville nobody recognises you!”

The forestry roads of SEEF are strictly off limits for private vehicles, which officially makes the miners dependent on the services of the SEEF truck (see pictures in paragraph on livelihoods) to take them to the nearest railway station once every three weeks. Unofficially, private vehicles do make use of the forestry roads as these roads are neither patrolled nor boomed off. In fact, even the boomed gate of the station of the Ministry of Water & Forest is usually open; the two young guards either not to be found or sleeping; or so was the experience of the research team. This station is near to the station Mikolé where the road is still public.

A long trail in the north links the zone to the Makokou region. If at all, this trail is used mostly by miners from the northern camps as the walk may be long, travelling through Matounga is at least just as long and more costly.

Longo has no access to government services. Private commercial parties do not provide schooling or basic healthcare services either. The miners would very much like to get access to the services of the SEEF forestry camp where a well-stocked camp store, a health centre and a school can be found. As SEEF is by law forbidden to allow others than its employees access to the camp services, miners are not welcomed in the camps unless in cases of emergency.

In fact, the needs of the mining zone, as expressed by the miners, are the following:

- Access to SEEF facilities,
- Technical assistance / better tools
- A central savings fund
- Better access, even a road
- Access to basic health care

6.3.5 Health and security

In Longo miners claimed no serious accidents had happened let alone death. This is a rare finding and it seemed miners wanted to evade the issue as a matter of pride. Given the low amount of respondents and due to the fact that most interviews were done group fashion which led to possible peer pressure issues, we could not verify this data. Still, seemingly strengthening the miners' claim of no fatal accidents was the fact that we did not encounter deep pits.

Health issues revolved around back ache and other work related minor injuries on the one hand, and around tropical fevers such as malaria on the other hand. Without access to medication, such smaller physical discomforts are not easy to suffer, particularly not in a hot and humid climate.

6.3.6 Education and skills

The large majority of the people had not received a tertiary education while a smaller majority had not finished secondary education. Longo enjoys no educational infrastructure, hence children of the miners do not live on site during the school season. One person, claimed to be a trained botanist who had hence received tertiary education, said working as a miner was more profitable than was working as a botanist.

6.4 ASM in Longo

6.4.1 Organisation of mining activities

Cartes d'expert are not carried in the zone for as far as this research could establish. What is more, most of the miners did not know what such a card was let alone them knowing they needed one to legally operate.

Anyone can enter the Longo zone and start a new pit. Yet, in line with habitual organisation in Gabon, once a pit is opened and once a camp is erected near that site, the miner who has opened the site becomes the owner. Miners working such pits will have to pay either nominal or profit sharing fees. Interestingly, in the absence of family and temporary workers, some miners, who had their own pits in isolated camps in the north of the zone, joined the Matounga pit operations; thus choosing to pay a fee over working their own pits where they would not have to share profits. They preferred to work in Matounga in order to earn enough money to buy a motor pump and water pipes so they could recommence working their own pits and because the supply of groceries was more regular in Matounga.²⁴⁷ Miners do not have to pay for staying in a camp if they have their own housing; only for working in someone else's pit.

The above illustrates the important role for seasonal workers and for investments in mining techniques. Without the two, one is all but forced to work the pits of others. Still, except for the youngsters in Matounga for whom the company of others and the almost maternal care of the chief's wife and her mother seem desired, all miners wish to work their own pits when possible even if this means working in isolation far from other camps.

6.4.2 Mining techniques

Panning for gold is still done the traditional way using materials such as shovels, motor pumps, wooden sluices, a pan etc. In the area of Longo, the rivers Longo, Komba, Abondjé, Métonga are gold-bearing. At least one miner used the motor pump to blast water for excavating pits and to pump water during the concentration of findings. The miners showed two sites comparable in size; one was excavated in two months by hand, another was excavated in just ten days using the blasting power of water from a motor pump. While the pit done by hand was a rational pit with straight pit walls, the pit excavated by blasting water was an irregular shaped pit and open on one side so that water used for blasting could flow out of the pit. The flow of the excess water proved to be a minor excavation force in its own right, dragging along earth as it passed. In the main Matounga pit, of the Matounga chief, motor pumps seemed not to be used for blasting but rather for getting water (see picture).

Like in Ndangui, no mats or other trapping devices other than riffles are used, angles of sluices seem random, riffles in sluices are one sometimes two and all sluices narrow towards the end at the same angle where sometimes not narrowing or different angles are preferable to improve concentration. Angles and narrowing of the sluices towards the end cannot be regarded without looking at the speed with which water is added to the sluice. In the case of Longo, no policy is visible; water is added at the speed the motor pump allows after which the water velocity is decreased through the top filter taking out the pebbles. All this together means gold gets lost and does not reach the concentrate.

²⁴⁷ Matounga is relatively close to the forestry road and being the collection point of *le bain*.



Figure 36: Mining in Longo

In short, but for the water pumps, mining techniques seemed not to have changed since the independence of Gabon in 1960. What's more, many pits are still worked using canals from streams to direct the water to the sluicing pits, sometimes in combination with a motor pump. In such cases, the canal is opened to guide water into an adjacent pit long enough for it to fill, after which, using hoses, the motor pump is connected to the water to pump water to use sluices for primary concentration.

6.4.3 Production

Following the mines, production equals that of Ndanguï: 1 gram on a bad day, 3 grams on an average day and 5 grams on a good day. Still, once more like in Ndanguï, miners shied away from talking production numbers. Also, even more so than in Ndanguï, it could easily be weeks of hard work collecting large volumes of the auriferous deposits, before concentration even commenced. In sum, the team did not obtain trustworthy let alone exhaustive information on production in Longo. Given its cyclical growth and decline of population, and given the mentioned relation between production and population numbers, production numbers are to be cyclical as well.

6.4.4 Key stakeholders

Given the distance between the camps and the challenging access, there is little cohesion that would allow marking Longo as one human settlement zone. The access trail to the SEEF concession is an important entry point to the zone and hence many miners pass Matounga from time to time, exchanging information.

Key stakeholders are not as numerous as they are in Ndanguï due to the fact that Longo has neither administrative status nor population numbers to attract to government institutions. One exception is the strong relation with the brigades of the Ministry of Water and Forest due to Longo zone being located in the Dji-Dji watershed. Furthermore, the miners have a stronger relation with the logging concession company, SEEF in the case of Longo, than have the miners in Ndanguï. In total only seven stakeholders were identified in the focus group. Note that different stakeholder roles may come together in one person, e.g. a miner hunting or fishing on the side. The key stakeholders are the following:

1. Miners
2. Transporters
3. Hunters
4. Local administration (Prefet, Chef de Canton, Governor etc)
5. Forestry company, SEEF
6. Gold buyers
7. Brigades of the Ministry of Water and Forests
8. Large Scale Mining company

Interestingly, all relations with external actors are considered strained at best except for with the gold buyers. SEEF is particularly seen as an unwilling stakeholder, despite the fact that the miners can come to the forestry camp in case of

an emergency, that there is regular transport to the station to collect supplies, and regardless of the shed SEEF has built. In essence, the miners blame SEEF for not doing more for them, particularly not allowing miners access to the facilities of the forestry camp such as schools and shops. Yet, SEEF, by law, is not allowed to accommodate anyone but its own employees to the facilities in the camps. This argument is, however, wasted on the miners who accuse SEEF of obstructing their basic survival. With the incident with the sub-prefet, according to the Matoenga chief, relations took a nose-dive. Notably, the chief of Ville Meyong is milder regarding SEEF, suggesting that the strained situation may have not been helped by an antagonistic attitude of some from Longo.

The brigades of the Ministry of Water & Forests are not popular as they are accused of a lack of respect. Most damning was a previous mission of the ANPN not that long before that of the research team. During that mission, rifles were confiscated, miners had been tied up and even some physical force was exchanged. The miners claimed the force to have been utterly unnecessary had the agents shown respect. Clearly the issue was not settled when the research team arrived in Longo with in its midst the deputy conservator of Ivindo NP and another eco-agent, both of whom had been part of the contested mission. Indeed, the young eco guard got into a fist fight on our first night in Longo.

The one stakeholder the miners did not mention was the Ministry of Mines. It is not that the miners are unaware of its existence, rather the Ministry is simply not deemed a stakeholder; neither known, neither expected, nor desired. Having been without any support or other interventions of the Ministry since the reopening of the zone and being unaware that Mr Gilbert in the 1980s operated under tutelage of the Ministry of Mines, the attitude towards the Ministry of Mines, and the state as such in fact, cannot come as a surprise.

6.5 Environmental impacts



Figure 37: Impacts on water in Longo

In the pictures above, three impacts on water are distinctly visible. On the left one sees two streams converging. Water coming from the right comes from a pit. Its turbidity heavily affected, light no longer passes in the water let alone to the bottom, critically affecting aquatic life. The extent of the turbidity is highlighted by the clarity and faster flow of the water coming in from the left, as is indicated by the visible turbulence.

The second photo from the left shows residue from the motor pump and generator fluids in stagnant water. As one can expect, discarded fluids from pumps are not recycled or centrally collected but rather enter the waterways and end up in the sea. On the right, the picture shows a canal dug to reroute water. The canal is currently not in use as it was used for explorations. Using that water, new pits of the chief are opened yet not operational, hence no water is needed there for the moment. Also, the canal seems to have been dug before motor pumps arrived in Longo.

The impact of motor pumps is lower than it is in Ndangui, yet that is more due to the number of people using them in the zone of Longo. The enthusiasm with which the miner from Ville Meyong showed us the 'benefits' of using the water blasting method (as well as showcasing the difference in environmental impact NOT using it) alludes to an increase of this method. This would be particularly worrisome in the north of the Longo zone as the waterways there are part of the Dji-Dji watershed.

On the upside, as the pits in Longo are not deep and as Longo is elevated, the impact on groundwater levels seems limited if present at all. Tailings seem not to clog waterways, yet. That is not to say any form of tailing management was perceived; it was not. Once more though, as the pits are not as deep, even though the put wall soil is clay soil, erosion is minor issue.

6.6 Conclusion of all case study research

The situation at Minkébé is exceptional

While a national scoping research exercise is needed to say conclusively,²⁴⁸ based on observations from the Longo and Ndangui field studies, the Minkébé camp is believed to be atypical for ASM in Gabon for three reasons:

1. It is the site of a gold rush, mostly caused by Cameroonians.

Minkébé camp is a rush mining site, contrasting sharply with other sites which are more typical of long established community-based mining. The boom in Minkébé is likely mainly caused by its proximity to the Cameroonian border, the large available labour force in Cameroon and other neighbouring countries and the fact that population density, poverty and unemployment are much higher in the countries surrounding Gabon. Combined with the higher wages in Gabon and its easy access, this made Minkébé an attractive destination. This finding is highlighted by the fact that the employees in the owners' pits in Minkébé were usually Cameroonians, or at least not Gabonese.

2. The ownership of the pits and the thereto related organisation of extraction

In Gabon a person customarily acquires ASM pit ownership by digging a pit, after which it has become his. Payment to labourers is based on fees or fixed profit-sharing arrangements for miners working in the pits of others. The rationale being that the pit owner has already invested time and money in the exploration and even excavation. A miner with some understanding of the operations and its yields can thus work for a week and be more or less guaranteed gold. These are ideal constructions for students and other temporary miners who lack the time and skills to start their own pit.

The structure in Minkébé was more commercial than the communal operations observed in Longo and Ndangui. The ownership structure in Minkébé closely resembled that of small-scale mining corporations in that there were employees, investment in techniques, rationalisation of extraction, and job hierarchies tied in with specialisations. As far as is known, no other artisanal mining zone knows such a mode of production where the owner controls the complete extraction process and uses hired labour. Though in other zones miners do work for pay, in kind or otherwise, this is incidental and often as a favour to friends who need a hand in their pits. Such a favour is bound to be returned should the need arise. Clearly, such 'employment' has little to do with the unique operations of the pit owners in Minkébé.

In Ndangui, it was rare for people to work in another miner's pit other than to lend a helping hand. In Longo, the two leaders, relatives of the old founders, seemed to work towards a hybrid form as they claimed the area around the settlements of which they functioned as unofficial chiefs. Yet, as arrangements are based on profit sharing, the 'owners' had an incentive to direct new miners to gold and to make profit arrangements such that miners would not choose to leave mining or rather try their luck and start their own pit outside of the realm of the owners.

3. The depth of pits

Neither in Longo nor in Ndangui are pits as deep, 40 meters and more, as they were in Minkébé. While pit depth is based on geology, of course, it is also linked to the miner having access to the financial resources to pay for such deep operations. For example, in Minkébé, working with employees and the availability of financial reserves to pay these employees allows a pit owner to dig for some time without finding gold, which is often needed.

ASM was well established in the Minkébé zone, and in the region as a whole, ever since Mr Roux had opened up the region for ASM in the 1930s. As Minkébé became a protected area in the late 1990's only, it is fair to say that the national park came to the miners and not the other way around. Consequently, it may be argued that it is the park that deprives local people of a livelihood and income streams that had existed for roughly 70 years before the creation of the park. Particularly the Baka, a tribe of forest dwellers, were hard hit.

Other observations from field study:

Environmental impacts

The impact of ASM on water levels and on water-courses can be profound, as the Ndangui, Longo and Minkébé examples undeniably indicate. Observed impacts on water can be broken down into:

1. Diversion of watercourses to bring water to the pits, either by the creation of canals or through extraction of water through motor pumps. The latter changes the water levels and the speed of the current, causing

²⁴⁸ If Minkébé proves to be exceptional, then exceptional strategies may need to be applied there as compared to other sites in Gabon for introducing ESER-ASM.

sedimentation and alteration of river courses.

2. Clutter of waterways though debris but mostly by mud hosed away to find gold,
3. Affecting groundwater levels as pits are kept dry. This deeply affects nearby plants whose roots can no longer extract enough water from the ground.
4. Change in turbidity levels of the water, affecting aquatic flora and fauna.

Observations on power relations

Talking with policy makers and conservationists about miners the impression has risen that in Gabon miners are considered outlaws, by choice no less. However, much like the national parks came to the miners, rather than the inverse, lawlessness came to the miners and was not so much created by the miners. The miners have been bereft of rational law enforcement ever since the Ministry of Mines withdrew their field operations in 1996. Hence miners are not outlaws by choice but by lack of law enforcement. Still the reigning perception of miners as outlaws leads to many forgetting that miners are people with families and daily needs, and as citizens are protected by the law, like any other citizen of Gabon. Indeed, the duties and fees of miners seem unbalanced by rights and services. Furthermore, the weak position of miners in the law promotes radical solutions such as evictions over long term engagement with miners in concert with all key stakeholders.

7. CRITICAL CONCEPTS IN ‘RESPONSIBLE’ MINERAL EXTRACTION AND GOLD SUPPLY CHAINS²⁴⁹

As described earlier in this report (see 3.1.1 and 3.1.3), over the last several years there has been an increasing interest in making ASM more environmentally and socially friendly. These expectations are often characterized as “Responsible ASM” or, as referred to in this report, “Ecologically and Socio-Economically Responsive Artisanal and Small-scale Mining” (ESER-ASM). Increasingly, and in diverse contexts worldwide, there have been breakthroughs in achieving ESER-ASM, where ASM becomes an economic activity contributing to income and local development whilst minimising environmental damage. The establishment of sustainable supply chains (SSC) has increasingly become one of the cornerstones of multi-pronged strategies to effectively professionalize, manage, regulate and increase benefits from the ASM supply chain to achieve ESER-ASM.

Based on interest expressed by the Gabonese government to explore an SSC-approach to achieve ESER-ASM, this report details this topic in further depth. This chapter presents critical concepts in sustainable mineral extraction and gold supply chains based on a wide range of international experiences of countries in aiming to realise a viable and responsive ASM sector. It concludes with an analysis on if and how an SSC approach – or elements of it—can be used in the Gabonese context.

7.1.1 Critical Concepts in sustainable gold supply chains

In order to establish Sustainable Supply Chains (SSC), the methods by which the gold is produced, traded and transformed *and* the governance structures of the organizations engaged in these different activities must conform to a suite of criteria that target issues and opportunities in social, economic, governance, labour and commercial categories.²⁵⁰ Achievement of an SSC typically requires:²⁵¹

- Commercial viability, offering assurance to the consumer of quality aspects, e.g. achievement of or progress towards being legal, managing social, environmental risks, maximizing development opportunities, and benefitting all legitimately involved in the chain.
- Credibility, providing integrity of assurance guarantee and effectiveness, that calls for a chain of custody process to guarantee that the gold bought by the ‘ethical’ buyer is in fact the gold from the ‘ethical’ mine.
- Management of environmental and social risks and increased contribution to sustainable development.

7.1.2 International Standards for Sustainable Supply Chains

There are four categories of Standards that seek to deliver some enhanced ‘level’ of ethically produced and sourced mineral raw materials to the market. In order of increasing level of sustainability performance, these are:²⁵²

1. **Chain of Custody Standards** that allow for the mineral’s origin and chain of custody to be known.
2. **Issue-based Standards** that promote best practice in risk management on *specific* issues only.
3. **Risk Management Standards** that promote best or good practice in risk management on a wider range of social and environmental issues than issues-based standards.
4. **Development Standards** that seek to mitigate risks *and* optimise on the development opportunity that the mineral capital presents. This gold can be called ‘sustainable’.

The lowest common denominator of all SSC Standards is that they address a non-satisfactory situation and propose a “standardized” solution. Depending on the nature of the standard-setter, mandatory or voluntary compliance is aimed for.

Recently, a series of standards and guidance have been developed or are under development, to resolve issues of conflict minerals and illicit trade through chain of custody approaches. Examples of such standards are the “OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas” (OECD DDG) or the World Gold Council’s “Conflict-Free Gold Standard” (oriented at large-scale mining only). For a roadmap towards ESER-ASM these standards are of minor relevance, except in two ways. First, they provide assurance that supply chain operators are managing the risks of what some stakeholders would deem to be the worst

²⁴⁹ This report section was written by Felix Hruschka and Estelle Levin; it has been edited by this report’s author (Hollestelle) and editor (Villegas).

²⁵⁰ Levin, 2010; Stark and Levin, 2011.

²⁵¹ Levin, 2010.

²⁵² From Levin, 2011.

human rights abuses and some other social and environmental risks in their supply chains. Second, at a political level, some risk further contributing to the marginalization of ASM as they do not provide for the reality of what it is to be an artisanal or small-scale miner.

Another group of existing standards for the minerals sector focuses broadly on management of the specific risks and issues of large-scale mining, without explicitly reaching out to the ASM sector. Examples are the Extractive Industries Transparency Initiative (EITI), the International Cyanide Management Institute's (ICMI) Cyanide Code, the International Finance Corporation's (IFC) Sustainability Framework, the International Council of Mining and Metals (ICMM) Sustainable Development Framework, the Equator Principles, and others. Many of these voluntary governance and industry standards require audits but do not provide compliance-based certification. For a roadmap towards ESER-ASM these standards provide some guidance, particularly for ASM evolving into small-scale mining. However, almost all ASM is far from falling into these standards' scopes.

A third group of voluntary social and environmental standards, which fall into the above categories of "development standards" and "chain of custody standards", aims to make claims at product level and is based on requirements at the level of the mine and further downstream the supply chain. The standards in this group share the approaches to rely on third party certification and to have a broader sector scope explicitly recognizing ASM. Sorted by increasing relevance for ESER-ASM, these are:

- The standards under development by the Initiative for Responsible Mining Assurance (IRMA)
- The Responsible Jewellery Council's (RJC) Code of Practices (CoP) and Chain of Custody (CoC) Standards
- The German Geological Survey's (BGR) Certified Trading Chains (CTC)
- The Alliance for Responsible Mining (ARM) and Fairtrade International's (FLO) "Fairtrade and Fairmined Standard for Gold from Artisanal and Small-scale Mining, including Associated Precious Metals" (FT/FM)

Particularly CTC and FT/FM have been developed from bottom up with a focus on ASM. Following these pioneering initiatives a larger number of SSC standards initiatives is expected to join the trend and launch modified or derivate standards for ASM (e.g. IMU-Control: FairForLife, Solidaridad: Goed Goud, SECO: Better Gold Initiative, etc.).

CTC's hypothesis is that "certification systems can be a suitable instrument in appropriate cases for increasing transparency and good governance in the extraction and processing of mineral raw materials and to reduce environmental impacts, support the compliance with minimum social standards and resolutely counter illegal resource extraction".²⁵³ CTC principles refer to (i) traceability and transparency, (ii) labour and working conditions, (iii) security, (iv) community development, and (v) environmental protection.

The **FT/FM** Standard states its objective as being "to promote the formalisation of the ASM sector, bringing with it improved working conditions for producers, strengthened producer organizations with the capacity to lobby for legislation and public policies that promote a responsible ASM sector, improved environmental management (including mitigation of the use of mercury and ecological restoration), gender equality, progressive elimination of child labour in mining, fairer market access, benefits to local communities in mineral rich ecosystems, and improved governance to this sector".²⁵⁴ Core elements of FT/FM are social development, economic development, environmental development, adequate decent labour conditions, trading relationships of certified producers and traceability.

In practice, for grassroots ASM the relatively elevated level of requirements and compliance criteria of international SSC Standards may appear a major entry barrier. This is not an intentional elitist approach, but an unintended consequence of attempting to propose solutions to the wide range of non-satisfactory conditions found in global ASM. For a roadmap towards ESER-ASM in Gabon and in other target countries of the ASM-PACE project it is a few steps too far away to aim for international certification in a first instance.

7.1.3 Local and B2B assurance schemes for Sustainable Supply Chains

While international SSC Standards for ASM have started to surface only a few years ago, local business-to-business (B2B) assurance schemes have a long trajectory. Even more, standards initiatives were inspired by the success of B2B initiatives such as in case of the "Green Gold – Oro Verde®" scheme in Colombia, set up as local third party certification scheme by the NGO's Corporación Oro Verde, Biodiversidad and Amichocó and initially exporting to CRED Jewellery in UK. At a smaller scale, the second party assurance scheme EcoAndina in Argentina can be mentioned, which created direct trade relations with a German importer. Another effort was also initiated in Madagascar and Bolivia under Urth Solution, which was framed upon universal concepts that provide the foundation

²⁵³ BGR, website accessed May 2012, http://www.bgr.bund.de/EN/Themen/Min_rohstoffe/CTC/Approach/Political-Background/political-background_node_en.html.

²⁵⁴ ARM, website accessed May 2012, <http://www.communitymining.org/index.php/en/fairtrade-and-fairmined-standard>

for sustainability (dignity, community, health, resiliency, family, commercial viability, etc. etc.) and allowed miners and their communities to define the ways in which their gold production and trading methods do or do not help them achieve related objectives. This list of B2B assurance schemes, particularly if also including responsibly and traceably sourced gemstones, can be extended to dozens of successful independent efforts to establish SSC, linking artisanal producers in developing countries to ethical consumers in western markets. The strength of these B2B schemes is the direct and personal contact between the ASM producer and the ethical jeweller and subsequently the “story behind” which the jeweller can tell the consumer.

A recently observed trend strengthens the link between SSC Standards and B2B SSC assurance schemes. ASM producers that have gained initial experience with B2B assurance schemes are considered likely candidates to “upgrade” to higher-level SSC Standards. E.g.: Miners of the Oro Verde initiative in Colombia were among the first to obtain FT/FM certification, and other similar groups are reported to consider following their example. Lower level B2B assurance schemes for SSC and progress oriented local standards can therefore be seen as possible entry paths to later compliance with international SSC Standards.

A particular aspect with regards to the FT/FM Standard and the aspirations of the ASM-PACE project to resolve ASM issues in Protected Areas and Critical Ecosystems is that ASM operations in such critical areas are excluded from certification as FT/FM, unless they can demonstrate a positive environmental track record and have an appropriate environmental management plan approved. It is considered unlikely that other eventual future SSC Standards for ASM will set a lower entry bar in protected areas. Starting to implement ESER-ASM under local standards and B2B assurance schemes appears therefore the most promising strategy to build such positive track record.

7.1.4 Organization in the ASM sector

Even in “unorganized” ASM, artisanal miners are organized.

Horizontal organization: Self-employed individual miners usually form informal workgroups with the purpose of joining efforts and based on verbal agreements to share the produced mineral. Typical group sizes are 4 to 10 individuals, large enough for joint heavy tasks, but small enough for each participant to oversee the rest of the group.

Mixed organizations: Most frequent are profit and risk sharing agreements between miners who contribute tools and machinery, and ordinary miners who contribute their workforce. Such schemes can tend to be more horizontal if the equipment owner participates in manual work and receives a higher share (usually agreed as a share for the machinery), or more vertical if the equipment owner has a “supporter” role, e.g. a local hardware shop owner, who limits his participation to receiving a share in exchange for the equipment. Miners in such profit-sharing groups are still “self-employed”, as their income depends entirely of the success of their work; they, as well as the equipment owner share the risk of no income if no gold is found.

Vertical organization: At the other end of the spectrum are small local entrepreneurs who contract miners. By instructing workers and distributing tasks they impose their organizational scheme. In such schemes, miners receive pre-agreed wages per time or volume of mineral, and chances of profit or loss are entirely with the entrepreneur.

All of the above organizational schemes can be ESER-ASM or not. Horizontal schemes are more likely to be ESER, as work has more characteristics of a collective free decision. Vertical schemes have more likelihood to be ESER during preparation of pits or during rehabilitation work, as miners are also paid for work that does not immediately produce gold. The main criteria is only whether the organizational scheme provides income that allows for a decent living or not.

The main (or only real) incentive to form larger workgroups than “technically” necessary is for pursuing common interests or self-defence against external influence. This applies at the level of self-employed miners, workers or entrepreneurs. Formalization to secure the rights to mine is therefore an important driver for organization. Experience has shown that miners formally organize in whatever legal form needed to assure their rights, but internally still organize initially as workgroups. Experience has also shown that the more entrepreneurial the organizational scheme is, the more chances for long-term success it has. Idealistic cooperative approaches usually fail, because miners do not organize to cooperate, but to make a living or to make profits. Their chance of failure is even higher in ASM of high-value commodities like gold or diamonds, where “trust” has a high chance to be abused.

To pursue common interests, second level organizations of ASM, at community-, regional- or national level are desirable for ESER-ASM. Such gremial organization can be incentivized, but can never be externally “created”. ASM projects (governmental, NGO-led or private) often constitute such incentives, by offering services to ASM

organizations. The institutional sustainability of such ASM organizations depends on the empowerment of leaders, as well as on institutional empowerment, delegating permanently required tasks to such organizations.

Best practice is to

- a) Avoid “social engineering” by introducing new organizational models, but to promote that type of productive ASM organization which fits to the cultural traditions best and which offers the highest compatibility with the legal framework for formalization.
- b) Incentivise the creation of gremial ASM organizations (within cultural traditions) by empowering and convening community leader and assigning them collective tasks considered priorities by themselves.

7.1.5 Can SSC contribute to address the gaps in Gabon’s ASM sector?

Compliance with SSC standards is not an end in itself. SSC Standards propose “standardized” solutions to non-satisfactory situations. SSC Standards are just another tool to achieve satisfactory situations. For some tasks however, several tools are necessary. To change a tyre, both a lifting jack and a wrench are needed; to convert informal, environmentally and socially depredated gold digging into ESER-ASM (*Ecologically and Socio-Economically Responsive Artisanal and Small-scale Mining*), not only compliance-based incentives (e.g. Fairtrade and Fairmined Price and Premium) are needed, but also an adequate, enabling legal framework based on a clear vision and a broad stakeholder consensus on how ESER-ASM should look like.

Given the range of standards and assurance schemes available, successful establishment of SSC requires a comprehensive understanding of the opportunities and constraints along the entire supply chain from mine to market, to choose the right SSC tool. This might be an international SSC Standard, or this might be initially a lower-level progress-oriented local standard or B2B assurance scheme.

Identification of workable strategies to support sustained implementation also needs to take into account the country’s overall experience with SSC Standards in other sectors. In the forest sector, Gabon is among the leading African countries in terms of FSC certification, while Fairtrade certification in the agricultural sector is still in the very beginning.²⁵⁵ As an artisanal miner’s mindset is usually closer to agriculture than to more industry-like forestry, implementation has to begin from scratch. This may be both a challenge and an advantage.

Please see Chapter 8.2 for specific recommendations on initial next steps should there be interest in pursuing a business-to-business (B2B) SSC scheme or an SSC scheme based on international voluntary standards.

²⁵⁵ FSC (www.fsc.org): 15 certificate holders; Fairtrade (www.fairtradeafrica.net): 0 certificate holder. Both websites accessed May 2012

8. RECOMMENDATIONS AND CONCLUSIONS FOR DEVELOPING ESER-ASM IN GABON

The following are recommendations for attaining ESER-ASM in Gabon, followed by a discussion of a number of potential future scenarios regarding the management of ASM and its impact on protected areas and critical ecosystems in Gabon. These recommendations are meant to inform a larger policy discussion that will need to be held with all relevant stakeholders, in order to design a practical roadmap for ESER-ASM in Gabon.

Artisanal mining, when done properly, can employ a significant number of people, and, contribute significantly to state revenues, with limited damage to the environment. Gabon, with its political vision of both green economic development, conservation and promotion of the mining sector, offers opportunities for the development of an environmentally responsive artisanal gold mining sector. The fact that, so far, no mercury is being used (as far as the researchers have been able to verify) is an additional positive factor that adds to Gabon's opportunities to mine 'green gold'.

The following actions are suggested to start building a solution. We emphasise once more the importance of involving all relevant stakeholders (the Ministry of Mines, the ANPN, the Ministry of Water and Forest, the fully state-owned Gabon Mining, civil society, other land owners and the miners themselves, in the solution). Piloting a number of these suggestions in one or two selected sites is highly recommended.

8.1 Legislation, formalisation, and regulation

Given the fact that Gabon is in the process of finalising the development of a new Mining Code to govern the industry in Gabon, it is important to ensure that this new legal framework facilitates ESER-ASM. Updated regulations could advance the vision of ESER-ASM by doing the following:

1. ***Address the specific rights and duties of artisanal miners (as opposed to small-scale mining operations), including long term security of tenure and, realistic, environmental and safety requirements.***

While bearing in mind the capacities of artisanal and small-scale miners to adhere to complex environmental regulations, the law can be strengthened to incorporate realistic and manageable environmental demands on ASM.

This should be paired with an approach towards ASM in the new mining code that emphasises its rationalisation and professionalization, but working from existing structures. The aim should be to strengthen the miners' duties as well as their rights. Limiting of *cartes d'expert* to defined concessions could help to rationalise artisanal mining, to give it a literally rightful place next to SSM and LSM, and to entice miners to invest in their undertaking.

If one wants miners to invest in their work, there should be an appealing long term security of rights. However, at present miners can be evacuated from their pits without compensation and without clear motivation or clarity on their legal rights. Miners should be entitled to challenge evacuation of 'the closing of their 'zone' as the law puts it.

Key questions & possible next steps:

1. *Initiate a participative and inclusive debate on development opportunities created by responsible ASM, focusing on ASM as an economic activity that is part of the extractive industries sector and not as a "social phenomenon".*
2. *Work towards a consensus of key stakeholder groups (Government agencies, civil society, ASM miners, industrial miners, etc.) on ESER-ASM and required framework conditions to enable ESER-ASM.*
3. *"Translate" the consensus into a legal concept*
4. *Link the process of promoting an enabling legal framework for ESER-ASM with an empowerment process of facilitating the creation or the strengthening of a national ASM organization, empowering a group of ASM leaders to lobby for "their law".*

5. *Avoid direct external involvement; always keep in mind that “Gabonese laws are made by Gabonese people”.*

2. Clarify the notion of Artisanal Mining Zones (AMZs) and include Artisanal Mining Zones as a type of concession in the Mining Code.

Current law does not adequately clarify the notion of AMZs. It mentions the closing of an artisanal mining zone, yet does not provide for the opening of a zone for artisanal mining. The criteria and process for opening a zone must be defined.

It may prove beneficial if the notion of ASM zones were to be re-introduced in the law. A zone would then be demarcated and ideally its borders would be fenced or otherwise be made visible, thus setting tangible parameters for where miners can and cannot go according to their *carte d'expert*

Key questions & possible next steps:

1. *Promote a policy discussion on whether AMZs are really a helpful and proactive instrument for steering ASM activities. Aren't they rather reactive? Are miners moving into AMZs or are AMZs rather declared where ASM are? Should the government seek to get rid of AMZs altogether, or just define them better?*
2. *Disseminate the concept that mining (artisanal and industrial) can only be done where nature placed a mineral deposit.*
3. *Raise awareness that ASM miners are usually the first to discover new deposits and are therefore important drivers of economic industrial development. Isn't confining ASM in AMZs counterproductive in that aspect?*
4. *Include the debate on AMZs in the process of promoting a more enabling legal framework for legalization and formalization.*

3. Recognise artisanal mining as a legitimate and officially recognized profession.

Its current lack of official occupational status is contributing to its invisibility as an economic force and, accordingly, contributing to the marginalisation of the sub-sector as a whole.

Increase investment in the sector will bring increased stability and incentives for personal investment.

Key questions & possible next steps:

1. *Are any vocational education training (VET) programmes (training centre, mining schools, courses, extension services) available in Gabon?*
2. *Are their training curriculums or activities recognized as formal VET?*
3. *Work with VET institutions and agencies on establishing programs for professionalization of ASM miners.*
4. *Keep in mind that the existence of professionalization programs is the most convincing argument for recognizing an activity as “profession”*

4. Set a realistic, highly competitive national gold price that is a high percentage (e.g. 95 per cent) of the London Fix.

Gabonese law already allows for the setting of a national gold price and while that policy ought to be revisited,²⁵⁶ it is unlikely to change in the short term. Therefore, instead of setting a national gold price with

²⁵⁶ Generally, governmental intervention in local trading of ASM gold needs to be either avoided, or oriented towards increased market transparency. Gold is a globally traded commodity and any national intent to control markets is an extraordinary undertaking with many risks. In most cases, it is doomed to fail. For example, attempts of Governments to buy local ASM gold below world market price, are (besides of ethically questionable) equal to issue an invitation to illegal traders to buy gold at similarly low prices and to engage in outbound smuggling. Attempts to capture “national” ASM gold through subsidized prices above market price, are (besides of uneconomic use of taxpayers money) an invitation to illegal traders to engage in inbound smuggling from neighbour countries. Such unintentional strengthening of criminal networks engaged in illegal trade will become a much worse problem than ASM, because once such networks are in place, they can easily “diversify” in ivory, drug or weapons trade. An alternative to ‘crowd out’ already existing illegal buyers, increased market transparency (information on real gold price), by the Government or other stakeholders has the potential to reduce their profit margins and to make Gabon unattractive as a “smuggling marketplace”. While it is appreciated that there may be political reasons as to why maintaining a policy of setting a national gold price is preferred, there is a danger that needs to be monitored : setting a gold price in practice may inadvertently deepen its smuggling problem. However, it is recognized that Gabon already has a national law setting gold prices, therefore the solution of setting the national gold price to as close to London Fix as possible is set forth here.

a number that will quickly be outdated due to constantly changing gold markets, the author recommends setting a national price based on 95 per cent of London fix to crowd out criminal networks in the short term.

Key questions to consider & possible next steps:

1. *Further investigate experiences from other countries where the gold trade has successfully been brought under government control through market interventions, as well as the road to follow to eventually liberalise the gold price.*

5. Develop a model for the organisation of miners, adapted to the Gabonese context

Based on existing systems, a model could be developed on how best to organise Gabonese miners. This should take whichever form is most appropriate given existing structures; it does not necessarily have to be in the form of cooperatives but could be an association of individual entrepreneurs, a union, or other types of entrepreneurial units. Neither the current legislation for cooperatives, nor the efforts to enforce this legislation on miners, seem productive to that extent.

While the current legislation on ASM cooperatives can be improved on many items, some stand out:

- Erecting a cooperative should not allow the control of the government over miners through the control over their cooperative; rather it should increase the control of the miners over their lives if only as miners' current resistance to cooperatives is based on a perceived loss of independence. This explicitly does not imply that the government should not have control over the artisanal sector in ways comparable to other economic, mining sectors. The point is rather that cooperatives lose their identity as an independent economic actor if the government becomes part and parcel of the cooperative. To appreciate this point, consider what a high-level of government involvement in traditional companies would mean for their independence and viability. While the government certainly has a regulatory role to play, artisanal cooperatives (or similar form of organisation) should enjoy similar independence over business decisions, structures, and business operations as traditional companies and other forms of cooperatives (agricultural, woodcraft, etc.). How and to what tangible benefits miners create cooperatives should be left up to the miners.
- Embed AM cooperatives into related existing legislation, also and notably **outside** the realm of legislation directly related to mining; chamber of commerce, tax, business law etc. spring to mind

6. Strengthen the field presence, capacity, and knowledge of the Ministry of Mines to work on and monitor ASM

Currently two field stations of the Ministry of Mines are operational: Franceville and Makokou. The latter is well located to work on ASM as the wider region is subject to increasing ASM activities. Yet, the Artisanal Mining areas north of Lastourville, the Etéké site, the Ndjolé site to name but a few, are far from any field office.

Appointing even only one well trained, and well equipped person per region would have a large impact in terms of information flow, distribution and monitoring of *cartes d'expert*, the location of miners, facilitating technology transfer etc. This can help improve relations between the miners and the Ministry of Mines, particularly if respect for the miners, professionalism and enthusiasm for the subject are key competencies of the incumbent.

7. Strengthen collaboration between different government actors working on artisanal mining

A large number of different actors are working on artisanal gold mining in Gabon. The establishment of a platform for dialogue between the Ministry of Mines, Gabon Mining, the ANPN, the Ministry of Environment, the Ministry of Defence and possible other governmental partners as well as non-state parties that are dealing with artisanal mining might be an effective way to move forward.

8.2 Strategies to manage ASM in Protected Areas and Critical Ecosystems

The following options for managing ASM in and around Gabon's protected areas are based on the Gabon case studies as well as ASM-PACE's international experience in studying management strategies of ASM in PACE contexts. Each should be carefully considered, and sometimes a combination of strategies will be most effective.

The case study research has demonstrated that ASM practices in Gabon are site-specific. A necessary first step must be to conduct a national scoping of ASM in Gabon in order to develop a national strategy, as well as site-specific strategies for the most urgent cases.

1. Consider allowing negotiated access to certain ecologically sensitive areas, under very specific conditions

Given the ongoing demand by local Gabonese residents for the pits to be reopened; and the apparent support by local Gabonese residents and miners for immigration controls on the Minkébé site, one scenario is that the Minkébé pits could be reopened with conditioned access for strict environmental controls and the presence of immigration and other law enforcement officers.

Indeed, law enforcement is key to any ESER effort be it Minkébé or Longo. Bear in mind the memorandum of understanding between miners around the Minkébé NP and key conservation stakeholders as brokered by WWF was neither signed nor enforced.²⁵⁷ Had this been in place and enforced, it is very likely that the Minkébé camp and its satellites would not have gotten out of hand.

The success of this option is more likely if repeated recommendations to stem the influx of illegal Cameroonians are adhered to by frequent though irregularly patrolling the Minkébé trail and its surroundings, and by engaging Cameroonian border authorities.

Possible next steps:

1. *Revise the conditions of the previous Minkébé agreement to ensure it reflects as far as reasonably possible the principles of ESER-ASM*
2. *Develop a term sheet for negotiations with miners and establish upper limits of acceptable number of miners in the buffer zone, ensuring the buy-in of all competent authorities.*
3. *Engage in participatory scoping meetings and negotiations with local residents and miners using representatives selected by locally-appropriate customs*
4. *Ensure that an agreement contains clear responsibilities of miners to control the area, as well as transparent and enforceable measures in case of non-compliance.*
5. *Work with the immigration ministry on feasibility of semi-permanent presence, regular patrols of Minkébé trail.*
6. *Coordinate with Cameroonian border officials.*

2. Develop partnerships with natural resource extractive companies.

Natural resource extractives companies, e.g. mining and logging companies, have a great potential role in safeguarding Gabon's unique ecosystems. Further, there is an increasing overlap between traditional ASM locations and the concessions of larger-scale commercial mining and forestry companies, which will lead to the displacement of ASM most likely to existing or new ASM sites in other sensitive ecosystems so spreading the environmental impact.

Authorities and companies could address the impacts of displacement and also improve community relations via partnerships that would allow artisanal miners to work in parts of the logging or mining concession, with suitable terms that would be mutually agreed between the company and artisanal mining communities (and government, where applicable). Such agreements should even become a pre-requisite for exploration companies, who often determine their exploration targets using "occurrences of ASM" which then obviously ends up being to the artisanal miners' disadvantage should a project move to mine development. Cooperation between industrial and artisanal mining entities should be part of the companies' community engagement strategy. Besides helping companies obtain their "social license to operate," such cooperation could also help mitigate their impacts through the introduction of environmentally friendlier and higher yield processing techniques taught by the company or a third party provider.

²⁵⁷ Particularly if repeated recommendations to stem the influx of illegal Cameroonians had been adhered to by regularly patrolling the Minkébé trail and its surroundings and by engaging Cameroonian border authorities.

The Responsible Jewellery Council's Code of Practices and Chain of Custody Standards has provisions that are designed to incentivise gold, platinum group metals' and diamond mining companies to do just these things, in the interests of best practice and assuring 'responsible mining'.²⁵⁸

Possible next steps:

1. *Assess and potentially revise mining legislation to address any legal implications of partnership agreements between industrial mining and artisanal miners working in their concession areas. Any legal risks or liabilities for the concession owner? Any incentives?*
2. *Conduct a workshop with industrial mining entities (Probably through UMIGA) and the Government to explore how this might best work, consulting the ICMM publication "working together" and similar guidelines and perhaps involving organisations, companies and governments who have considered or attempted these types of arrangements in other countries (e.g. Goldfields, Ghana; various in DRC; Eurocantera, Honduras; Responsible Jewellery Council member mining company working in Peru; Solidaridad, etc.). The fact that most mining operations in Gabon are still in the exploration phase offers opportunities to conceive 'partnerships' from the very early start of mining projects.*

3. Adopt Mining-Mindful Land Use Planning across government ministries.

When Minkébé's status changed from a reserve to a national park, the borders of Minkébé changed too, thus replacing the former 'finger' shape by the current 'finger' shape to accommodate for possible future industrial mining of iron ore as well as the main ASM sites.

We underscore the importance of taking artisanal mining activities into account in present future land use planning processes to prevent similar conflicts where possible. The report notes that current law allows the borders of national parks to be changed (see section 3.5.3). Such a drastic action would not be generally recommended, but may be the best option in certain circumstances.

Possible next steps:

1. *Undertake a national scoping and resulting mapping of artisanal mining in PACE in Gabon, to feed into the national land Use Planning Process.*
2. *Integrate geologic data in land use planning processes.*
3. *Create awareness among governmental agencies involved in land use planning processes that all greenstone belts and banded iron formations have the potential of gold mineralization and are therefore potential (and probably existing) AMZs (as well as zones of potential interest for industrial mining).*

4. Use evictions only as a last resort, but if you are going to evict resource, plan and do it well.

While evictions are the most used strategy worldwide to address ASM in PACE locations, they are very prone to failure. It is therefore important to emphasise the real risks evictions bring:

1. Evictions often fail because eviction planners often do not understand the context, such as the hidden but significant role ASM may play in local and regional economies and the reasons why ASM is such an attractive livelihood to people owing to the multiple functions it serves for vulnerable rural individuals and households.²⁵⁹
2. Evictions can also fail because planners do not understand or appreciate how evictions risk exacerbating conflict, arms proliferation and human rights abuses.
3. Evictions have the high potential to disrupt local economies that have developed based on ASM and also alienate communities who have gained livelihoods through the trade. Hence, evictions are not recommended but as a last resort in cases of critical risks to local or even national security.

In order for an eviction to succeed in the long-term:

1. There needs to be a sustained security presence. Depending on the structure, this can be a costly endeavour and also risks the corruption and clandestine entrenchment of the security forces if they

²⁵⁸ For additional information on RJC standards, see: <http://www.responsiblejewellery.com>.

²⁵⁹ People often undertake ASM because it offers opportunity to earn higher income for unskilled or illiterate individuals.

become involved in illegal mining. The permanent establishment of an effective law enforcement regime in ASM zones, either through frequent patrolling and / or to the creation of outposts of law enforcement agencies, could be a more effective and less risky alternative to evictions. If established in the early stages of ASM site development, the need for evictions may be avoided altogether.

2. There must be an exit plan developed prior to the eviction, i.e. what needs to be done to structurally expel mining even without security forces present. Such a plan should include: (1) the long-term security plan; (2) facilities for reimbursements; (3) a compensation framework; (4) resettlement measures (thoughtfully, sufficiently and sustainably replace the economic activity they would be disrupting for the same period of time); and (5) a grievance mechanism. Each of these components should be designed and implemented with the oversight of an independent credible international third party monitor to guard against the potential for or claims of human rights abuses.

Possible approach / strategy:

1. *Exhaust all options*
2. *Be realistic in long-term planning requirements vis-à-vis state capacity, rural development goals, economic potential, and long-term feasibility of alternative programmes that would provide the same-level of income and benefits for Gabonese miners in the area. A gender lens with all programmes is critical to economic and social development and preventing gender-related human rights abuses.*
3. *Guarantee long-term financing for such programmes, including for post-eviction activities.*
4. *Create contingency plan for the potential that the eviction may fail.*

5. Consider short and long term policy measures that can enable a Sustainable Supply Chains (SSC) approach.

Sustainable supply chains are market-based development initiatives aiming for improved social, environmental and economic performance of producers and driven by end-consumers' demand for products with such ethical qualities. SSCs have increasingly become one of the cornerstones of multi-pronged strategies in other contexts around the world to effectively professionalize, manage, regulate and increase benefits from ASM and work towards ESER-ASM. It involves the organisation and formalisation of ASM and the downstream trading chain, the introduction of environmentally responsible and socially beneficial production methods, financial benefit sharing, and enhancement of the sector's economic contributions.

Two types of SSC can be broadly distinguished: (i) SSC schemes based on business-to-business (B2B) relations between producers and buyers and relying on first- or second party assurance of compliance, and (ii) SSC schemes based on international voluntary standards, involving potentially large numbers of producers and buyers and relying on independent third party certification.

1. B2B based SSC schemes are "relatively" easy to establish, once an interested partner²⁶⁰ at the demand side is identified. They mainly depend on a convincing (and obviously facts based) "story" of the gold which can be told to the end-consumer.
2. Standards based SSC schemes use elevated levels of compliance criteria which, currently, would be a major entry barrier for almost all Gabonese miners.²⁶¹ With increasing progress towards ESER-ASM the gap between requirements and reality on the ground however decreases. The first step is creating the right policy environment and institutional supports to help the sector eventually reach these goals. Therefore, while it is too early in the development of the ASM sector for it to immediately pursue a SSC approach, the approach is worth noting here for the purposes of being 'destination' achievements to which to aspire.

As all SSC schemes involve commercial relations, miners must be the rightful owners of the product (gold) and must have the right to trade it. All known SSC initiatives interact directly with producers.

²⁶⁰ This report does not mention names of potential B2B partners, in order avoid promoting particular companies. Potential companies, mainly small jewellers, are abundant and easy to identify: a Google search for the term „fair gold“ in June 2012 rendered 97,000 results.

²⁶¹ For example, a particular aspect with regards to the FT/FM Standard and the aspirations of the ASM-PACE project to resolve ASM issues in Protected Areas and Critical Ecosystems is that ASM operations in such critical areas are excluded from certification as FT/FM, unless they can demonstrate a positive environmental track record and have an appropriate environmental management plan approved. It is considered unlikely that other eventual future SSC Standards for ASM will set a lower entry bar in protected areas.

The SSC approach can work well with the second strategy recommended here, where industrial mining companies may allow ASM on its concession and buy the gold from the miners perhaps as part of a Fairtrade/Fairmined or Responsible Jewellery Council certified scheme.

Further information on the SSC approach is given in Chapter 7.

Possible next steps:

1. *Take legislative steps to create the right policy environment and institutional supports to help the sector reach these goals²⁶², including a formalisation regime that provides incentives for artisanal and small-scale miners to formalise. See additional legislative recommendations in 'ESER-ASM' recommendations below.*
2. *Identify potential ASM sites where a SSC approach could be piloted in the next 2 years and produce a facts-based strong and convincing narrative about these sites, in particular how ASM contributes and how ESER-ASM could contribute even more to development.*
3. *Start from an easier to implement B2B based SSC approach and publish the "story" in media reaching the target group of ethical jewellers. Engage with SSC-committed interested buyers.*
4. *Provide producer support to the ASM site enabling miners to meet the expectations of the B2B SSC buyer.*
5. *Always keep the long-term goal of ESER-ASM participating in Standards based SSC schemes in mind.*

The recommendations below should be considered in the context of the above: a comprehensive policy framework to address artisanal mining at a national level is essential to make the recommendations below truly effective.

8.3 Additional measures to manage ASM and its impacts within critical ecosystems in Gabon

1. Monitor the use of chemicals in ASM to prevent from the use of mercury and other chemical entering the Gabonese ASM sector

Based on observations and reports from key informants, mercury is not prevalent in gold processing in Gabon. To ensure that this does not change through an influx of artisanal miners from regions where mercury use is common, a sensitive monitoring and response programme should be established. In areas where mercury is not used, the topic should not be addressed (to avoid stimulating the curiosity of miners to try it), but for areas where mercury use emerges, an awareness raising response team should be available and able to intervene rapidly. Mercury use should be assessed as part of the national scoping strategy. Gabon's current involvement in the mercury treaty is a positive sign. Thorough coordination between the mining and environmental authorities on this issue is needed though.

2. Identify a 'model mine' site and use it to develop models for ESER ASM around PACE in Gabon, giving the miners a role in environmental stewardship. The model mine could become part of a sustainable supply chain initiative too.

Such a model could be linked with an organizational "upgrading" of artisanal mining towards formal small-scale mining subject to more stringent environmental requirements. Such models would be particularly attractive in cases where the exclusion of ASM is not practically feasible and where eviction by massive long-term presence of security forces would create an even worse environmental impact and/or be unaffordable.

The existing mining techniques would need to be assessed, as would their impacts and those owing to the miners' subsistence needs. Mitigation measures would need to be designed to ensure the mining would be less environmentally damaging and more productive, as well as mercury-free. Inspiration can be sought from examples and experiences from Latin America and West Africa, where a lot has been done with simple techniques to make ASM more productive and environmentally responsive.

²⁶² It requires the establishing of conducive policies, laws and regulations, and also the political will and institutional commitment to implement them; Strong inter- and intra-sectoral coordination, including between central and local authorities in the different relevant sectors (e.g. mining, environment, social welfare); Genuine, gender-responsive engagement and empowerment of local communities, inclusive of public sector, civil society, miners and their families; Strategies to professionalize ASM and increase benefits from formalization, inclusive of efforts to build requisite capacity, establish suitable financing mechanisms, strengthen ASM organizations and introduce environmentally-responsible appropriate, intermediate technologies and methods; Support for harmonious co-existences between ASM and large-scale and exploration companies.

Successful model mines require:

- Permanent presence of a supervising entity (governmental or government appointed agency)
- Establishment of a supply chain for consumables to eliminate the need for undesired agricultural or bushmeat-hunting side-activities
- Development of an environmental management plan with simple, easy to understand technical, environmental and social rules of conduct for miners
- Incentives for active engagement of miners in protecting the zone (e.g. exclusivity agreements under the condition that miners protect “their” area from newcomers and comply with rules of conduct)

In the short term, such a model mine site (which through organizational “SSM-like upgrading” would be formal and therefore able to trade), might become a suitable candidate to be promoted for piloting B2B based SSC initiatives. A site where miners engage actively in protecting the environment would make up a good “story” to market. In the long term, and being able to prove a maintained positive track record under the supervision of the environmental authority, such models could even engage with SSC initiatives which aim to do third-party certification against social, environmental, and commercial criteria.

3. Invest in the rehabilitation of mined-out areas within protected areas

Priority must be given to ensuring the occurrence *and* longevity of efforts to rehabilitate mined out areas. Rehabilitation should be required of all legal ASM in Gabon, though this is hard to enforce or encourage without some type of support.

In addition, environmental organisations may decide to rehabilitate areas within protected areas that have been mined in order to direct the re-colonisation of important local species and restore the ecosystem, as far as is possible.

A lesson learnt and worthy of consideration is that whenever attractive volumes of gold remain in a deposit or in tailings, miners will inevitably make sooner or later attempts to re-mine it, annihilating restoration efforts. To avoid this, deposits should be worked as completely as possible and aimed at the highest possible gold recovery, before engaging in rehabilitation of mining sites. If agencies intend to restore ecosystems within protected areas, investigation into the likelihood of miners returning to this site clandestinely should be made, and sensitisation done with local communities to get acceptance that an area is mined-out and not worth re-opening.

4. Address and improve the National Parks law on Protected Area buffer zone activities based on the Minkébé experience

The Law on National Parks needs to be refined with additional legal instruments in order to exclude uncontrolled artisanal mining from the allowed activities therein. The experience of Minkébé has indicated beyond doubt that the social and environmental impacts of uncontrolled ASM, whether direct or indirect, have no place in a buffer zone.

5. To discourage poaching within Minkébé and promote local sustainable development, reopen the ASM pits, invest in eco-guards and eco-police and turn miners into environmental stewards. If possible, this should be linked with the ‘model mine development mentioned above.

One management option here may be to reopen Minkébé with the strong presence of different law enforcing agents such as ANPN eco-guards as a deterrent for poachers and illegal immigrants alike. Small satellite camps by these agencies will strengthen the impact of such deterrence. Given the past experiences, anti-corruption measures are key to such efforts. Emphasis also needs to be put on the limits of the Park and the buffer zones, as at the moment, a lot of confusion exists on limitations amongst the different actors.

This would need to be combined with building relationships with miners and mine pit owners and reward them for their contributions towards conservation, including reporting cases of poaching to the authorities. The (semi-)permanence of ASM in or near a protected area or critical ecosystem make them excellent candidates for supporting efforts to monitor poaching activities.

Miners and pit owners should be incentivised to take their role in environmental stewardship through environmental sensitisation campaigns and by setting clear and transparently communicated and enforced rules that actively discourage and disallow involvement in poaching. Not following these rules should be a reason to close a mining camp. This would create social pressure in and around camps and help to convert miners into conservation agents. For this, good and lasting relationships of cooperation will have to be built.

6. *Anti-poaching efforts should use national, regional and international collaboration & international expertise to target the larger criminal networks*

Undeniably, local strategies for fighting ivory and other poaching through raising the awareness of miners and securing their cooperation is obviously desirable, but it would not be enough. As with all illegal trade around the world, whether ivory, minerals, or small arms, the rule is: the bigger the potential gain, the more resilient and professional the networks involved and the more these networks involve people in powerful positions. Without making headway on the eradication of these criminal networks, all anti-poaching field missions, no matter how well intended, will do very little unless the bigger networks are targeted.

Intensify the collaboration between Gabon, Cameroon and Congo on border control, to stop illegal influx into mining sites, and fight illegal wildlife trade. The permeability of the borders between Gabon and Cameroon, and Gabon and Congo, facilitate illegal transactions of people, gold, arms and ivory in the Minkébé region. Strengthening border patrols will enhance security in the area.

7. *Participatory creation of a management plan for the Zone Périphérique, and management of the peripheral zones included in Park management Plans.*

The creation and, first, definition of a *zone périphérique* for the different national parks, as stipulated by *Loi n°003/2007 du 27 août 2007 relative aux parcs nationaux*, article 13-16, will also mean a significant step forward in including current users in defending the integrity of the parks.

A *zone périphérique* includes those ecosystems adjacent to the parks which are deemed essential to maintain the conservation value of the parks. Such zones differ from buffer zones in that land use of the zone is to be negotiated with the users of the zone. In fact, the management plan of a *zone périphérique* will have to define under what conditions ASM can be allowed.

Once the *zones périphériques* are established, the Mining Code would need to be altered to incorporate the conditions placed on mining in such zones.²⁶³

8. *Increase the presence and the strength of ANPN in the national parks*

The minimal field presence of both ANPN and conservation NGOs needs to be addressed sooner rather than later in order to curb the increasing threat of ASM (and other activities) to the integrity of the parks. Efforts should be made via budget increases and other measures to strengthen the operationalization of ANPN's mandate to uphold regulations in the national parks. Emphasis should be placed on building human resources and ensuring robust physical infrastructure as, 10 years after the erection of the parks, no permanent outposts have been created in which eco-guards are to be stationed. In addition, the number of eco-guards should be such that rotation of teams in field stations is possible; i.e. 3 weeks in the field, 6 weeks off of which the latter three in preparation of a new field mission. Rotation of field postings could help prevent corruption.

9. *Develop partnerships with forestry companies to manage artisanal mining in forestry concessions.*

As forestry concessions border national parks, as forestry concessions are tasked with protection of ecosystems, and as much of AM is taking place in forestry concessions, partnering with forestry companies seems imperative. Given their knowledge of the field, the local ecosystems, and given their on the ground capacity and infrastructure (e.g. roads, transport and camps), forestry companies seem uniquely placed to add to facilitate and, to an extent, enforce ESER standards on artisanal mining

²⁶³ Loi n°003/2007 du 27 août 2007 relative aux parcs nationaux, article 13-16

10. Develop partnerships with Mining companies operating close to protected areas (the Belinga Concession adjacent to Minkébé NP is a good example in case)

Partnership and early engagement are needed to ensure mining companies that are developing concessions where ASM is taking place do not displace artisanal miners into the national parks and adopt responsible engagement, compensation or employment strategies.

In specific cases, when there is no competition for the potential minerals, the potential for LSM to host an ASM 'model camp' on site can be investigated and encouraged through policy and legislative tools.

8.4 Recommendations for further research

While the research below is recommended to strengthen the understanding of ASM in Gabon and strengthen measures to make the sector more ESER, these recommendations are not meant to postpone action. It is suggested that these studies take place simultaneously, and are an integrated part of the selection of potential pilot sites for a 'model mine'; and that the selected sites are used to study various aspects of the techniques and impacts of ASM in more detail. However, some of the above recommendations do require further research to ensure understanding is at a suitable level to ensure appropriate and effective action.

National Scoping Study to begin in September 2012

With Support from the US Fish and Wildlife Services, in partnership with ANPN, and in collaboration with ELL, WWF-Gabon, is planning to carry out a rapid nation-wide scoping of ASGM in Gabon, starting in September 2012. This will be done in close coordination with relevant government agencies in order to support them, conservation organisations and other stakeholders develop appropriate and effective policies and actions for managing ASM in protected and sensitive ecosystems in Gabon.

To advance knowledge of ASM's impacts in Gabon, and to advance best practice models for possible national application this national scoping study should look at

- **The indirect effects of ASM in critical ecosystems in Gabon.** The direct environmental impacts of ASM on waterways are known. Yet, what the effects of those impacts consequently entail on the flora and fauna are not well known. Even less is known regarding the long term impacts of artisanal mining on biodiversity. Key questions to consider will be: How, in which timeframe and up to what size of disturbed land does natural recovery of ecosystems occur? Do technical rehabilitation efforts of ASM sites contribute or hinder re-establishing of original biodiversity? This topic is worthy of devoted expert research and on-going monitoring.
- **The use (or not) of mercury;** While ASM is not known to be in use in Gabon and it was not observed to be in use in the study sites, given the high environmental stakes in Gabon it is worth additional investigation.
- **The different modes of organisation of ASM.**

Key questions to consider as part of the national scoping study would be:

- *Analyse existing structures for organising ASM and consider the rationale behind these (in which circumstances do they function or not).*
- *Consider the motives and driving forces for miners to organize?*
- *What types of incentives lead (or would lead) to self-organization by miners?*
- *How might miners be incentivised to organize?*
- *How difficult or costly would it be for ASM miners to organize in shareholder companies and acquire mining licenses under the small-scale legal regime in order to ensure their rights?*

In addition to the national scoping, a stakeholders' capacity assessment will be needed. For long term planning purposes, a needs assessment of key stakeholders' capacity and enabling conditions for ESER artisanal gold mining in Gabon will be needed to look into the capacity of ASM stakeholders to fulfil their roles in advancing the recommendations set out above. This should be done after the recommendations have been considered and adapted into a strategic plan, in order to see what capacity building and enabling conditions are necessary to make the implementation of that plan a success.

The following topics can be integrated in the national scoping or be subject to separate studies, as we believe they will add significantly to a better understanding and improved management of the ASM sector in Gabon.

- ***Study and monitor the impacts of ASM on forest degradation in Gabon***²⁶⁴
As the Gabonese government is taking the lead to use aerial footage to monitor deforestation, to monitor ASM impacts, aerial footage could be used by the Gabonese government and other key conservation stakeholders. Monitoring of the zone can help establish the amount of deforestation due to ASM. Emphasising the usefulness of such footage is the fact that Minkébé camp can be spotted on Google Earth while these are not the best satellite images available.
- ***The economic contribution of ASM to local and regional economies***, in addition to other impacts ASM has in these areas in order to understand the benefits ASM brings and also the interests vested in it continuing in these places.
- ***The presence, impacts and management options for ASM in (sustainably managed) forestry concessions in Gabon***
- ***Study the structure, relationships, and practices of the ASM pit owners of Minkébé***
In Gabon the notion of the ‘ownership’ of the pits is unique and varies from site to site. Given the importance of Minkébé as a protected area and the importance of the pit-owners role in ASM in the Minkébé camp, a deeper examination is warranted. One of the subjects of such a study would be to look at how pit owners interact. Do they strategize between each other? Did they inform each other of workers fired so that other pit owners would not re-hire these? Is there joint transport of the gold, pooling security resources? Are security resources pooled? How, if at all, were they involved with other commercial activities? How economically viable would a legalised ASM business be? Would the existing organisational model be the most effective?
- ***The push and pull elements for engagement with ivory poaching and the role of criminal networks therein and the past and present, involvement of the criminal networks driving the ivory poaching in ASM***
The report questions traditional assumptions linking ASM and ivory poaching. It finds reason to investigate the rationale behind the raise of ivory poaching and to investigate the potential role of criminal network and traders operating in the Minkébé region.

8.5 Concluding Remarks

The time is ripe for action because of government’s enthusiasm to build a green Gabon and take active steps towards improving its ASM sector. This research was intended to help provide guidance to the government of Gabon and other stakeholders as to how achieving these dual objectives might be possible. It has concluded with a series of recommendations that involve improving governance, taking steps towards ESER-ASM, e.g. through SSC, acknowledging the limitations and unsustainability of evictions, considering alternative strategies, and proposing further research to ensure decision-makers are fully equipped with the facts in order to do this well.

To date, much of the attention to ASM in Gabon has focused on its social aspects—such as its informality, illegality, and association with poaching -- and overlooking its economic potential and environmental realities. This report studied three sites and the social and environmental impacts of ASM therein. The report also highlighted laws and policies that may be exacerbating the situation. The report finally made a series of recommendations to how to begin to work towards ESER-ASM and also strategies to manage ASM’s impacts in protected areas and critical ecosystem contexts.

This report is intended to be used as a starting point for designing a roadmap towards Ecologically and Socio-Economically Responsive Artisanal and Small-scale Mining in Gabon. While ASM-PACE can be a partner in such efforts, *if ESER-ASM is to be achieved and sustained, action must be driven and owned by State authorities with the meaningful inclusion of affected parties (ASM, communities, conservation organisations)*. Therefore, while this report suggests next steps and guidance from ASM-ESER models achieved elsewhere, this implementation process must be led by those who will ultimately have regulatory and legal authority over operations and supported by those affected by it.

The roadmap process could most likely begin with a workshop in which key stakeholders could consider the recommendations in this report and explore the following questions:

²⁶⁴ The Index on Biodiversity Integrity (IBI) developed by FERMON might be a good starting tool for this

- 1.) Are there other actions that should be considered besides those recommended herein?
- 2.) Of this full suite of possible interventions, which are deemed likely to be most effective and feasible for gradually establishing ESER-ASM in Gabon in the short-, medium- and long-term?
- 3.) What further information is necessary to inform this decision-making?
- 4.) What steps need to be taken and by whom in order to build a stakeholder-owned framework for action?
- 5.) What resources are necessary, and where might these be found, for driving this process forward?

Given the high environmental stakes—the high biodiversity value of Gabon’s largely-intact forest landscapes—and the current realities -- the increased popularity of ASM, there is a critical need to act early and strategically to find a balance between ASM’s potential to contribute to the nation’s development and growth, with the need to protect the nation’s other treasure: its forests, flora, and fauna. Gabon is at a critical moment to take action on its ASM sector for the good of the nation and the species within its stewardship.

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ANNEX A: BASIC ARTISANAL MINING TECHNIQUES

This section presents an overview of common artisanal gold mining techniques.²⁶⁵

Gravimetric concentration

Gravity concentration is a process to concentrate the mineral of interest (in this case gold) using the difference of specific gravity of gold and gangue minerals. The specific gravity of gold is 19.5 and the specific gravity of usual rocks is between 2.50 and 2.80. Gravity causes gold to settle in water faster than other minerals. The rate of settling depends on particle density, size and shape: Large, dense, spherical grains settle quickly, whereas small, less dense and flatter particles settle much more slowly. Coarser grained low-density particles can settle at the same rates as finer high-density particles.²⁶⁶

Panning ²⁶⁷

Panning is the most ancient form of gravity concentration. The circular or back-and-forth shaking of ore and water in a pan causes the ore to stratify the heavy minerals settle to the bottom of the pan while the lighter gangue can be washed off the top.

Panning is the basic means of recovering gold from alluvial and high-grade primary ore. Panning is an efficient and very low cost method of gravity concentration—unfortunately, miners can only process small amounts of ore in a day. While artisanal miners are usually expert panners and are able to achieve incredible results, even with the most rudimentary pans, they are sometimes unaware of the advantages of the range of shapes used by their fellow miners around the world.

Panners commonly use gourds, kitchen bowls or cooking pans to pan for gold. They also use specially designed gold pans made of wood, metal and plastic. Gold pans are usually round, but can sometimes be rectangular, as in Vietnam. Wooden pans have the advantage of having a slightly rough surface than can hold the gold a bit, but steel pans can be roughened by rusting with acid (or lemon juice), and new plastic pans can be given a “tooth” by rubbing with sand. Wooden pans also have the advantage of buoyancy, making it easier to support a pan full of ore in water. Pans can be cut from steel sheeting and riveted, or pounded into shape from steel oil or cyanide drum tops using auto-body repair techniques. Steel and aluminium pans are sometimes mass-produced by metal “spinning” processes. Cast aluminium pans are also available in some places.

Sluices

Sluices are inclined, flat-bottomed troughs that are lined on the bottom with a trapping mechanism that can capture particles of gold and other heavy minerals. Used correctly, sluices are efficient devices to separate gold from gangue. Sluices work on the principal that heavy particles (gold) tend to sink to the bottom of a stream of flowing water while the lighter particles (sand) tend to be carried downstream and discharged off the end of the sluice.

Sluices are used in various sizes, from small hand-fed sluices to large sluices found on dredges or fed by trucks, front-end loaders or bulldozers, which can process as much as 150m³ of alluvial ore per hour. Much like in the past, today's hand-fed sluices, not only in Gabon, are usually 1 to 2 meters long, 30 to 50 cm wide, with walls 10 to 30 cm high. Sluices are usually inclined at a 5 to 15 degree angle. Many miners working alluvial deposits today use large sluices when sufficient water and operating capital is available.

Good sluice design

Particles suspended in a slurry stream settle when the intensity of the turbulence cannot support them. A well-designed sluice insures that the maximum amount gold can settle near the bottom of the slurry stream where it can be caught by trapping mechanisms such as carpets or riffles. Trapping mechanisms shelter gold particles from being lifted back into the current by turbulent forces, holding the gold from being washed off the end of the sluice.

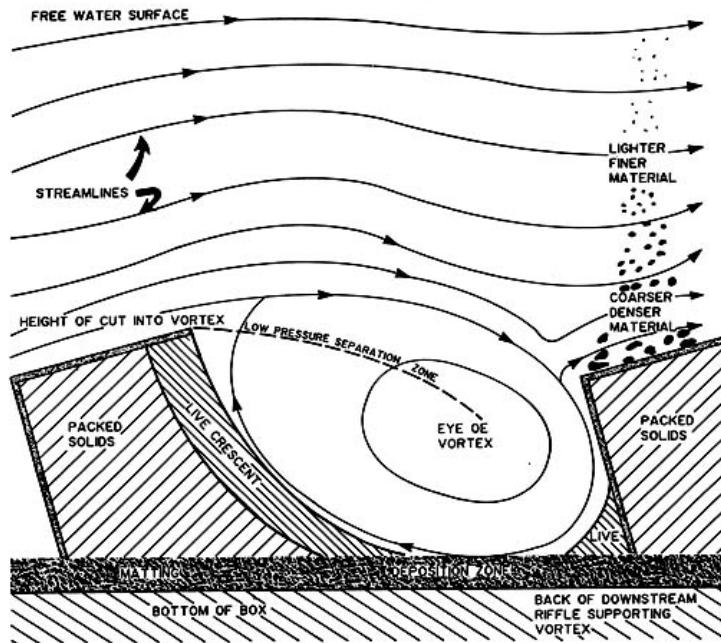
²⁶⁵ This section was written by Felix Hruschka and edited by the author (Hollestelle)

²⁶⁶ Based on <http://www.goldorecrusher.com/mining-knowledge/gold-ore-centrifugal-concentrators/>

²⁶⁷ Based on <http://www.scribd.com/doc/17149194/Training-Manual-for-Miners-Marcello-15>

In sluices where turbulence is low, the difference in settling rate between heavy and light particles tends to separate the slurry into loosely stratified zones. As the slurry stream flows down a sluice, the densest and largest particles accumulate in a zone close to the bottom where they can become trapped within the lining carpet's pile or weave and sheltered from the current, while the smaller, lighter particles tend to stay in suspension near the top of the stream and be carried off the end of the sluice.

The rate of flow influences how gold and gangue particles in the feed stream settle to the bottom of the sluice, and how they become re-suspended. Flow velocities are controlled by the amount of feed pulp, and by the sluice box's



inclination, width, and length. At low flow velocities, the densest and largest particles settle to the bottom, while the less dense and smaller particles remain suspended in the feed stream. On the bottom of the sluice, sediments in the surface layer move slowly down the sluice by rolling and sliding. Increased flow velocities can cause these sediments to be lifted and suspended or bounced downstream: High flow velocities cause turbulent currents that, if strong enough, can fully re-suspend the bottom bed load and carry it all downstream. For efficient operation, the slurry flow velocity must be adjusted fit both the range of gold particle sizes in the feed, as well as the trapping mechanism used. Flow should be fast enough to insure that the trapping spaces created by the riffles or carpet liner are not filled and blocked with gangue (i.e., the carpet must be kept from “sanding up”), yet slow enough to allow as much fine gold as possible to settle to the bottom where it can be trapped.

Increasing the angle of the sluice causes the flow velocity to increase; increasing the slurry depth by narrowing the width (or by increasing the input) also causes the flow velocity to increase; lengthening the sluice also increases the flow velocity as the slurry moves down the sluice because the fluid accelerates with distance. For a given feed rate and sluice width, the optimum flow velocity is empirically determined by incrementally increasing the angle of inclination until the trapping mechanism is clear of silica and other light gangue minerals (or the other way round, reducing the angle of inclination until the sluice starts sanding out, and increasing it again slightly).

The flow rate should be constant. The highly variable, discontinuous feed rates in hand-fed sluices are not efficient because the bottom carpet quickly becomes clogged with gangue, blocking the trapping spaces. In hand-fed sluices, water is poured onto the sluice one bucket at a time, but even at the peakflow of each bucket pour, the velocity is usually too low to lift much of the gangue and keep the trapping mechanism open. Even though some gold particles can become entrained within the surface sediments as they roll and slide down the sluice, the trapping efficiency of these surface sediments is much lower than that of a carpet with exposed fibers. Continuous gravity flow from a diesel barrel filled with water is better than pouring one bucket of water at a time into hand-fed sluices.

Gold ores typically contain a mixture of coarse and fine-grained gold particles. Because fine gold settles much more slowly than course gold, it is often best to use multiple stage sluices—capture the coarse gold using riffles, coarse expanded metal or/and vinyl loop carpets in a relatively steeply inclined first stage (faster flow velocity); then screen the coarse material off by using an inclined grizzly screen at the end of the first sluice, and feed the passing fine material (plus the water) onto a more shallow angled, perhaps wider sluice, where the remaining fine gold is

recovered on a more tightly woven or pile carpet. This second sluice can be oriented either perpendicular to, or underneath the first sluice in a zigzag configuration. Differently angled zigzag sluices allow variable flow velocities, while reducing acceleration of the slurry stream by shortening the length of the bed. The feed box for zigzag sluices usually has to be higher than straight sluices, so they work best when the feed can be pumped to the sluice, and when the discharge can be in the opposite direction as the feed. Zigzag sluices are used often in large alluvial mining operations.

Feed preparation

The ore should first be screened so that the particle size is as uniform as possible and the coarse barren material is eliminated. Under ideal conditions, the feed should not be coarser than the largest possible gold particle. Large rocks on the sluice create eddies and turbulence that keeps the fine gold in suspension; the high flow velocities required to move rocks off the sluice also leads to loss of gold.

The ideal feed contains between 5 to 15 per cent solids. A high percentage of solids makes the slurry too viscous - dense particles are buoyed upwards by less dense particles, limiting the ability of the slurry to stratify according to density. If very little water is available, and the gold is not too fine, coarse gangue particles can carefully be raked out of the sluice.

Sluice design and construction Miners should design sluices to accommodate the anticipated feed rate by adjusting the width (increasing width decreases depth and flow velocity). Note that adjusting the width strongly influences the flow velocity - width is considered by some researchers to be the best control of flow velocity. Flow rates can be fine-tuned by adjusting the slope. When possible, miners should design sluice features (e.g., angle, width, etc.) so that they can be changed to insure optimum recovery.

Flow accelerates with distance, making it harder for the trapping mechanism to capture small gold particles. Research has shown that 90 per cent of gold is recovered in the first 1/3rd of the sluice, 9 per cent in the 2nd 1/3rd, and only 1 per cent in the last 1/3rd. Most gold is caught in the first 0.5 meter of the sluice, so keep the sluice length short (less than 2 m for hand-fed sluices). Zigzag configurations break flow velocity and help to increase recovery; three 2m zigzag sluices are usually better than one single 6m sluice.

Trapping mechanisms

Bed linings should be firmly fixed to the bottom of the sluice, especially when not backed, to prevent captured gold from migrating down the sluice underneath the lining and being lost off the end of the sluice.

○ Riffles

Cross riffles made from railroad rails, angle iron, wood or split bamboo are often used to trap gold particles >1mm. The simplest riffles are stones, but these can cause turbulence likely to cause gold loss. Carpet and/or expanded metal should be used underneath the riffles.

Rudimentary riffles do not necessarily improve recovery--turbulence can break up stratification, and cause the loss of fine gold. While catching some of the coarse gold, riffles often only leave the impression that recoveries have improved.

Riffles protect the carpet lining from wear and keep it firmly on the bed of the sluice.

Ore with a range of coarse particle sizes may need to utilize several kinds of riffles (e.g., large and small expanded metal riffles).

Select riffle size and spacing, then select the flow rate that keeps the sheltering spaces behind the riffles clear of sand. 25 mm angle iron riffles are commonly used with 4.0-6.5 cm gaps, canted uphill at about 15 degrees. There should be very little sand between the riffles. If there is too much sand, the flow is either too slow, or the riffles are too high.

Expanded metal grating (see picture, below) forms shallow riffles which cause a local turbulence that keeps the sand moving downstream while providing effective shelter for gold grains less than 0.1 mm. Wider sluices need a heavier gauge metal to hold the liner flat.

When the ore contains some magnetite, Cleangold® (see below) sluices can form a magnetite bed that can trap fine gold.

○ Carpets

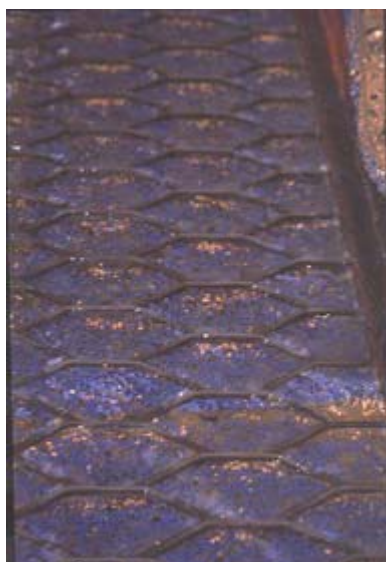
Type of carpet lining is usually determined by what is available. Fibrous or hairy fabrics like sacking, sisal, blankets, or old carpets have hairs that can trap fine gold particles and prevent them from being lifted back up into the current by turbulence. Animal hides are usually not a good option, because they tend to fowl. In general, the best carpets have open fibrous structures that let gold particles settle deeply in the lining. If rubber backed carpets are not available, use a tighter weave cloth backing underneath the carpet to prevent loss of gold. Wash carpets in a series of buckets, in barrels cut lengthwise into troughs, or in tubs.

It is important to test different types of sisal fabrics and carpets. The best carpet used in ASM operations is usually the 3M Nomad Dirt Scraper Matting, especially the type 6050 (medium traffic with backing) which consists of a coiled vinyl structure; type 8100 (an un-backed version) can also be used. Nomad is usually recommended for relatively coarse gold, but can also trap fine gold efficiently.

Photo above: Often used combination of expanded metal with Nomad carpet. *Photo courtesy of Felix Hrushka*

Optimal slurry flow velocity

Different trapping mechanisms require different flow velocities. Adjust the width and/or slope to control flow velocity to optimize the performance of the various riffles and carpets used. Coarse gold recovery needs faster flow velocity (narrower and/or steeper sections); finer gold recovery requires slower speeds (broader and/or less steep sections).



Keep feed rate and pulp density constant. Increasing the flow can increase turbulence and make it more difficult for gold particles, especially the fine gold grains which tend to stay in suspension, to contact and be trapped at the bottom of the sluice. Slowing or stopping the flow fills the trapping mechanism with gangue. Avoid turbulent flow, especially when trying to capture fine gold. Higher flow velocities can be necessary to keep the gangue from clogging riffles and carpets, but high speed tends to push fine gold off the end of the sluice. Lower flow velocities can yield higher recovery (fine gold is recovered in addition to the coarse gold), but if too slow, can lead to clogging of the trapping mechanism.

Photo above: In the left sluice is fine gold; in the right sluice is coarse gold. *Photo courtesy of Felix Hrushka.*



ANNEX B: REQUIREMENTS FOR A CONVENANT FORESTIÈRE AMÉNAGEMENT DURABLE (CFAD)

To come to a contract with the government for sustainable forestry management, a *Convenant Forestière Aménagement Durable* (CFAD), a company needs to possess or regroup permits to obtain the minimal required surface (200,000 hectares). If this is the case and the Ministry agrees with future exploitation, there will be the signing of a Provisional Covenant for Management-Exploitation-Transformation or as defined by the Gabonese law, a *Convention Provisoire d'Aménagement-Exploitation-Transformation* (CPAET). This covenant covers a three year period during which all the necessary preparations for a management and industrialisation plan need to be realised. The activities to adhere to the requirements of a CFAD are, spread of the 36 months of the CPAET, are depicted in figure 5.²⁶⁸

The elements of the CFAD permit which are of relevance for the purposes of this report are the social and biodiversity reports, related requirements and the resulting sustainable management plans.

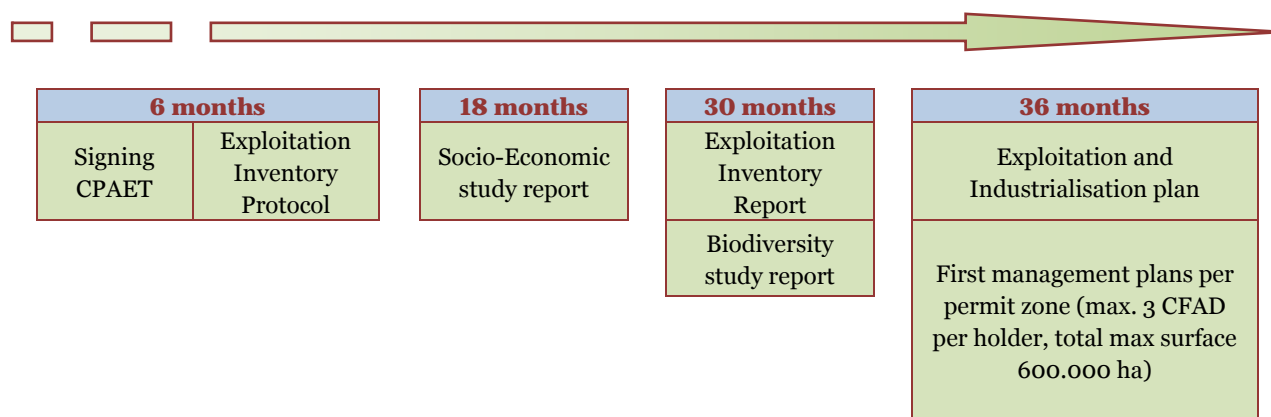


Figure 2 Steps towards a CFAD

Figure 39:: Steps towards a CFAD

Objectives of the biodiversity report are the following:²⁶⁹

1. **For flora** it aims to better understand the dynamics and the proliferation of vegetal species characteristic of the zone, identifying rare and/or threatened species. The findings should feed a relevant management regime.
2. **For fauna** it aims to identify habitats at risk of being destroyed as well as rare and / or endangered species meaning to determine protected zones and / or particular exploitation rules. Likewise, knowledge of the distribution of species within the forests should feed the planning of management activities. Additionally, impact assessment of human activities as well as a baseline survey for the monitoring of hunting and other impacts need be in place.
3. **For non-timber products** it aims to map the range of non-timber forest products which are used by the local populations.

Part of the fauna protection management is prescribed by decree 0689/PR/MEFEPEPN, in that vehicles of the concession holder are not allowed to carry hunting instruments or any, part of, animal capture of which resulting from hunting. What is more, not even sub-contractors can be even remotely involved in hunting. Even transporting a hunter is forbidden. To prevent employees from hunting, the concession holder is obliged to equip the forestry camps with grocery stores, use of which is restricted to employees only. On top of the aforementioned, the decree prescribes

²⁶⁸ Décret 0689/PR/MEFEPEPN

²⁶⁹ Le Guide Technique National pour l'aménagement et la gestion des forêts Domaniale

precautions regarding water management, e.g. no use of motorised equipment other than for infrastructure construction and maintenance, no extractions within 30 meters of waterways wider than five meter, and the clearance of waterways of all fallen trees and other wood. With such details available, it comes as no surprise that the decree also goes at some length to regulate waste management, be they lubricants, petrol, human consumer waste or even compost.

Furthermore, the decree is cognisant of infrastructure being the most detrimental impact of any extraction activity as roads de facto facilitate the movement of more people than employees. Hence, as part of a range of measures, roads are to be barred from use once a zone within the concession is no longer in use. Use of roads is not open to use by the larger public without permission of the concession holder.

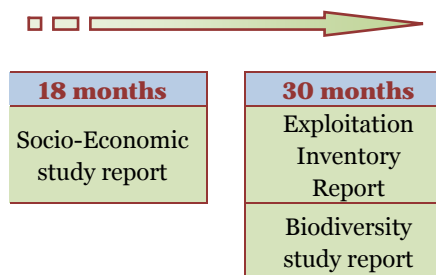


Figure 40: Steps towards a CFAD

Additional to the CFAD requirements, to guarantee the regeneration of forest and forest quality, the Gabonese government has regulated the diameter trees need to have before they get axed by means of directive 000117/PR/MEFEPEPN of March 1, 2004. Per species, the directive lists the prescribed diameter the tree needs to have acquired, measured 1.3 meters above ground, before extraction is permitted. For instance, Okoumé, or Aucoumea Kiaineana, the single most popular timber extraction species in Gabon, needs to measure 70 cm diameter. More than telling when trees can be axed, the directive also forbids felling of trees with diameters of two meters and more. These are classified as monumental trees.

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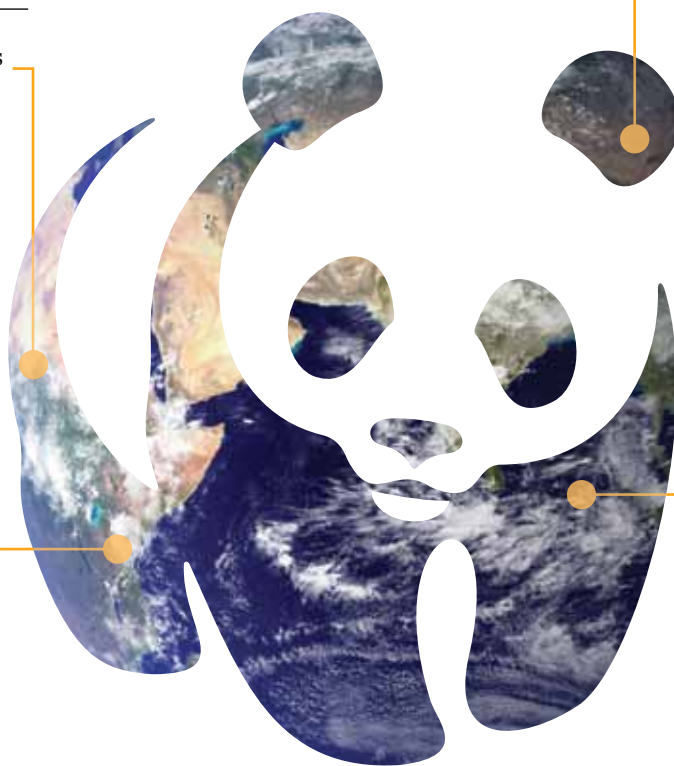


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