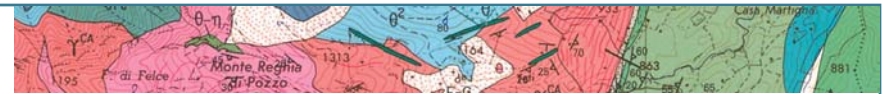


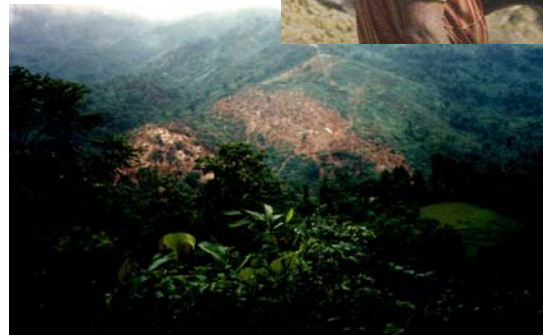
CASM - Annual meeting September 19 - 24

Salvador de Bahia



Natural Resources Management in ASM gold Zone of French Guiana :

a necessary balance between socio-economic stakes, environment
sustainability and rural communities stability



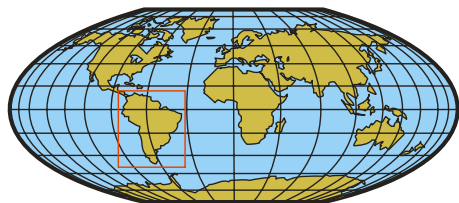
Dr. Jean-François Orru /

September 19 - 24, 2005

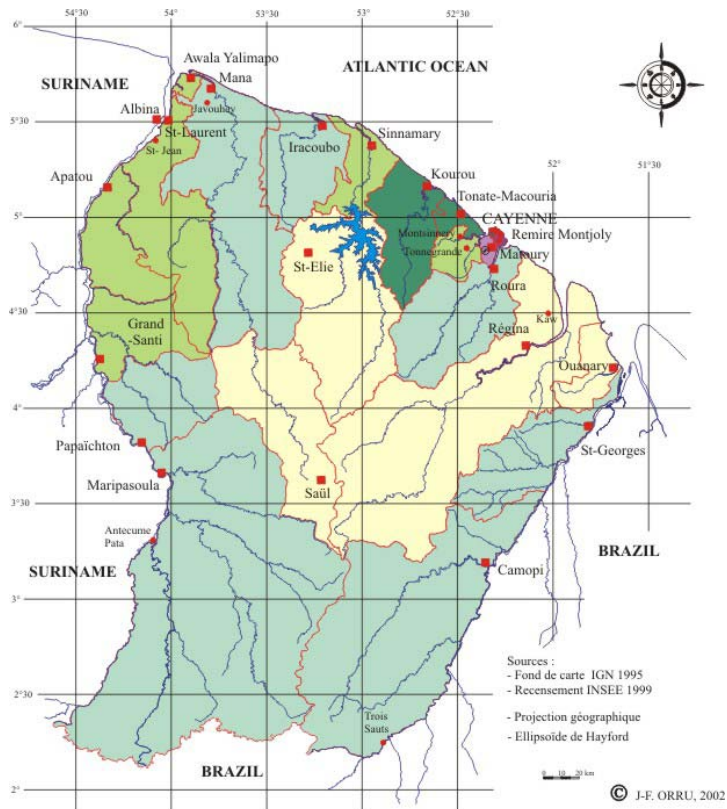
French Guiana, a small part of Europe in South America



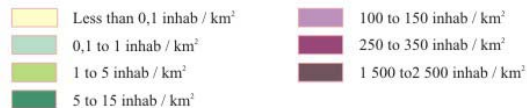
- **A part of large entities**
 - geological (guianas shield)
 - climatical
 - Biogeographical (Amazonia rain forest)
- **Europe in South America**
 - overseas department of France since 1947
 - Economic, administrative and social French and European framework



A small territory under-populated but coveted



Légende :



Population density of French guiana districts

- Territory and settlement
 - A low populated density (83 000 km² for 180 000 inhabs.)
 - a population unequally distributed, both inter and intra level district

 - A centre of attraction
 - Free health services & free schooling
 - Possibilities of jobs with good incomes (€)
- **flows of migration from the regional zone**

Small scale mining and operators

- **Mechanized exploitation of alluvial gold**

- On ground : flat plains exploitation of clays
- Under water : river bed exploitation of gravels

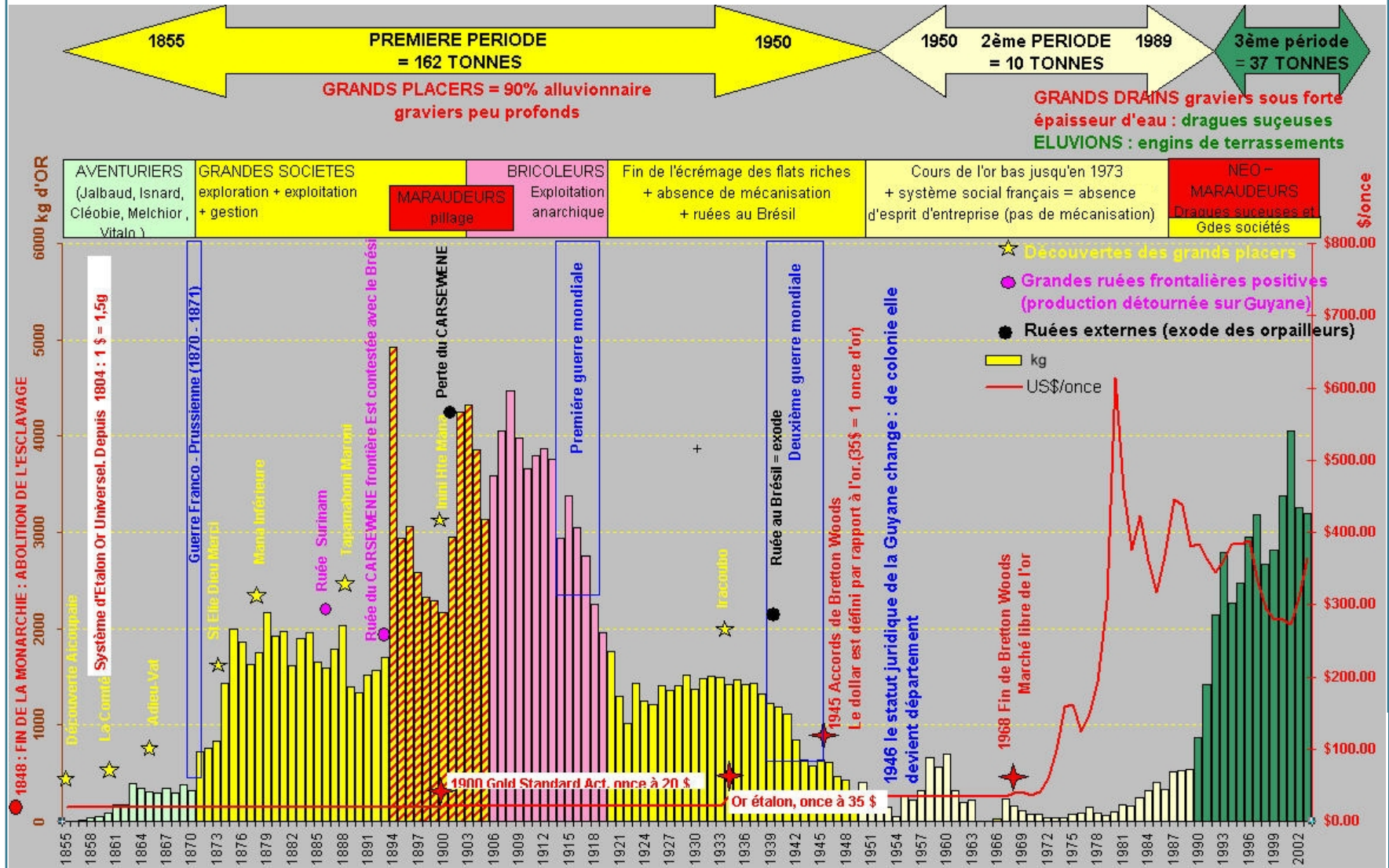


- **Specificities of the Maroni river**

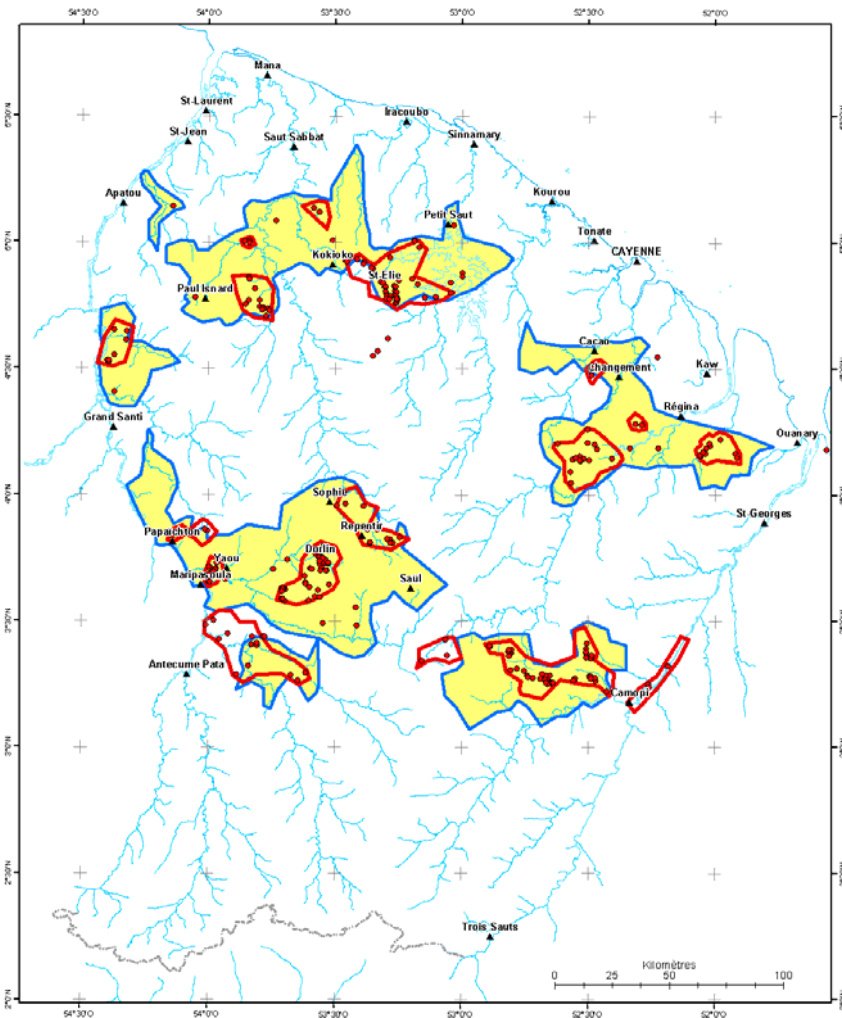
- « Ethnic » business
- a largely irregular activity
- the installation of a state of illegality for 10 years



A socio-economical History of gold

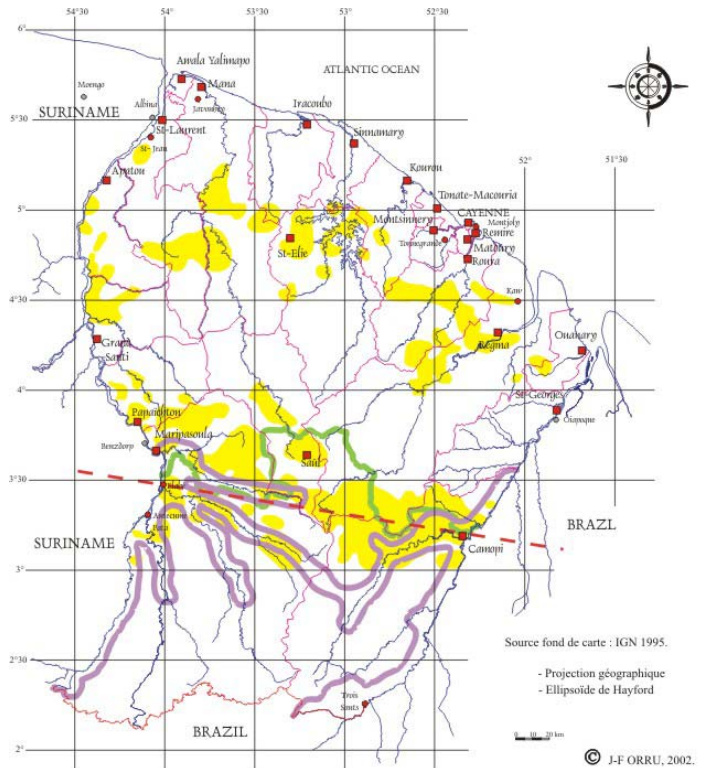


Characteristics of ASM zones



- **Small mines Vs. Small scale mines**
 - Differences : Respect of the legislation
 - Similarities : technical and financial means, brazilian labour
- **High mobility**
 - specialized and clandestine immigration
 - Progression of the small scale gold mines
 - Proximity of fuzzy borders & difficulties of control

divergences of interests on natural resources use on the same zones



Légende :

- Mains Rivers
- Administrative limits of districts
- Frontier South (Brazil)
- Chief-town of district
- Mains villages
- North limit of the reserved access zone
- Land-use zone of traditionnal communities (source : Grenand & Ouhoud-Renoux, 1995)
- Proposition of delimitation for the national parc of FG (source : Mission Parc, 2000)
- Gold mineralisations delimitations (source : BRMG, 1996)

ASM, substance and conservation.
Superpositions and confrontations of interest

- Small miners are the less conservation oriented actors
 - Mining is the only exploitation of non-renewable natural resources
 - ASM are often in isolated zone
- Indigenous People needs
 - Natural resources are essential or concern a large part of their sustainability
- Administration goals
 - Land planning is necessary for people settlement and needs (water, agriculture) and for conservation (National Parc Project)

Consider stakes and constraints relatively but not absolute

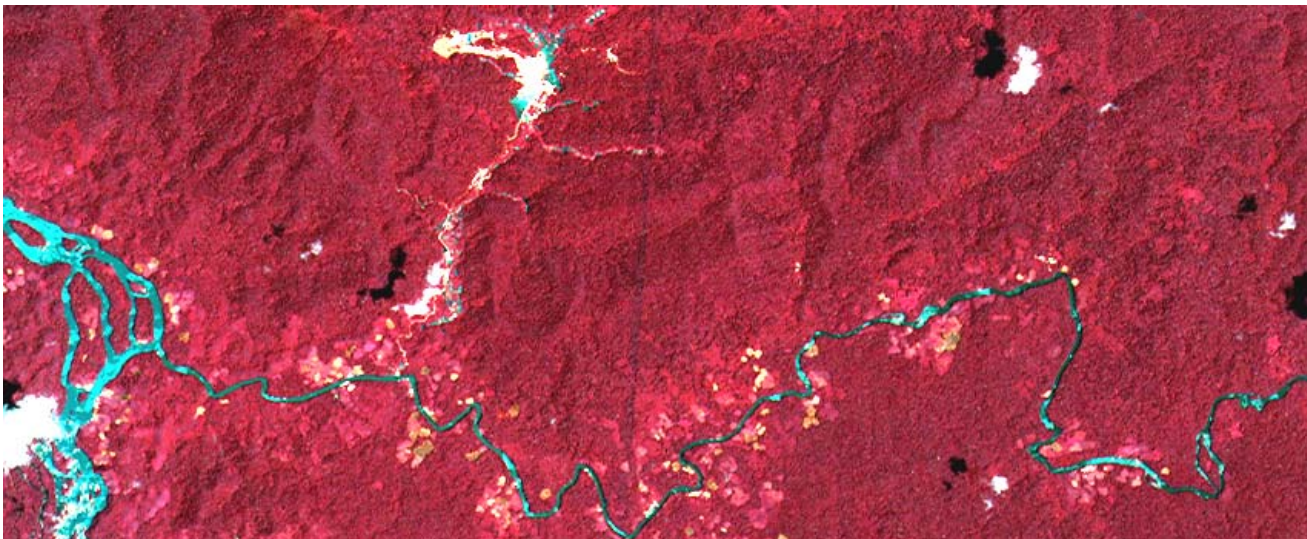
The necessity of a global and integrated management to solve and prevent land-use and resource use conflicts

- **Many priorities for the local development**
 - Basic infrastructures, public services, networks
 - Human settlement expansion
- **Land use and resource use management is necessary**
 - To prevent and / or solve conflicts
 - To build scenarios for sustainable development
- **Existing tools for management of gold activity**
 - Legislative : mining code, water law, waste remediation law...
 - Executive : DRIRE, ONF, Gendarmerie, Army
- **But difficulties of application**
 - In the field (access to the sites)
 - Regarding the economic potential (lobbies) & the political and social pressure

➤ **Decision makers need structured and regularly updated information**

Remote Sensing on ASM Monitoring

- **Remote sensing is a valuable tool for ASM monitoring due to :**
 - Access difficulties
 - Rate of landscape changes
- **Remote sensing provides a variety of scales :**
 - From global observation with high revisit capability (satellites), to detail level observation (airplanes)



The challenge : adapt monitoring space-time strategy to mining activity behaviour

- **Space** :

adapt spatial sampling to the spatial distribution of resource and population monitoring priority :

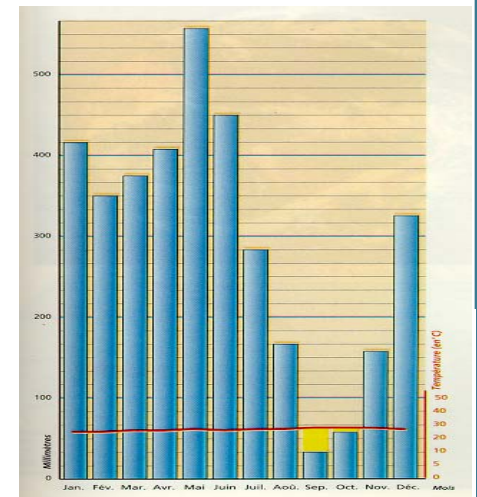
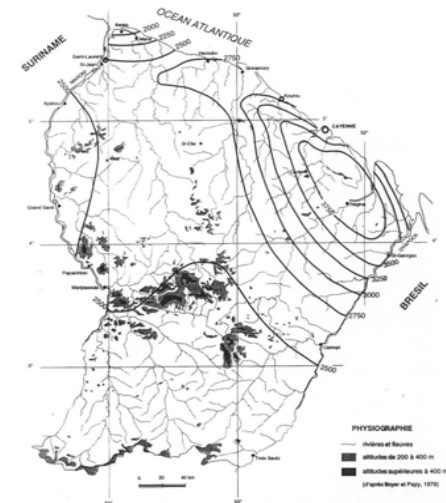
- In areas with high mineral potential
- In areas where mining was reported in the past
- in areas where indirect evidence is observed

- **Time** :

adapt observation updating to mining life cycle (from new sites opening to forest regeneration) with 2 constraints / limitations :

- orbital
- meteorological

For ex : SPOT revisit FG every 26 days (thus 3-4 opportunities max per dry seasons)



Remote sensing needs to be implemented

- **Remote sensing provides evidence of human settlements in general, and mining activity in particular :**
 - direct evidence
 - indirect evidence, like agricultural deforestation / downstream water with high concentration of sediments
- **Remote sensing is a technical tool, a first step towards decision-making aid**
 - As GIS & data bases, remote sensing can provide cartographic representations
 - the produced documents can be used as proof for the control of the activity and for its territorial management (geographical support to small miners)
- **These representations of reality must be supplemented by more traditional methods**
 - Natural and human sciences provide qualitative & quantitative informations for the comprehension of strategies
 - These informations can make it possible to draw prospective scenarii for governance

Actions R&D

- **This approach is currently used in Congo for artisanal exploitation of diamond**
 - Information collected by remote sensing are used for the constitution of chart for the field investigations
- **Towards a cooperation transboundary approach in the amazonian countries**
 - the regional laboratory of remote sensing of Cayenne has a reception station for the satellite images
 - Sensibilisation of the actors (decision makers, economical actors and forest communities)
 - Definition of regional team of experts

➤ **Towards an observatory of
the natural ressources management**

thank you for your kind attention...

For additional Information, please contact the BRGM / ASM team

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