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Welcome to the *Global Mercury Project* Home Page

The Global Mercury Project began in 2002 with a vision to address the environmental issue of mercury contamination from artisanal and small-scale gold mining. Foundational objectives of the project have been: to introduce cleaner technologies, train miners, develop regulatory capacities within national and regional governments, conduct environmental and health assessments and build capacity within participating countries to continue monitoring Hg pollution after the project finishes.

2007 News and Updates

Tuesday, January 06, 2009

- [Newsletters from Kalimantan](#). These newsletters provide a look at work being done in association with the Global Mercury Project around the community of Kereng Pangi, Central Kalimantan. The newsletters are available in English as well as Indonesian. The team in Kalimantan includes Bardolf Paul, Sumali Agrawal, Dzul Fikri Al Huda, Mayang Meilantina and Kartie Vitamerry. The most recent update can be viewed here: [December 2006 Newsletter from Kalimantan](#).
- October 26-27, 2006. Brussels: the European Commission hosted the International Conference on Managing the Supply and Demand of Mercury. Policy makers, industry representatives, non-governmental organisations and scientists were invited to participate in this event. Kevin Telmer represented the Global Mercury Project and gave a lecture titled [Mercury and Small Scale Gold Mining – Magnitude and Challenges Worldwide](#). Follow the link to view his presentation. The [conference agenda](#) can also be viewed.
- October 22-28, 2006. Training of the trainers - for Tapajos gold miners, Brazil. As part of the Global Mercury Projects' mission to Remove Barriers towards the Introduction of Cleaner Artisanal Gold Mining and Extraction Technologies, a group of GMP representatives met with gold miners from the Tapajos river basin in Creporizão, Pará, Brazil. The week long training event was titled "Cuide de seu Tesouro" or Care for your treasure. An [Aide Memoire](#) describes the goals and objectives of the training and includes a list participants and the agenda. A [picture document](#) has also been assembled by the coordinator, Rodolfo Neives.
- October 3 - 4, 2006. Washington D.C. Meeting on [Enhancing Global Policy to Reduce Mercury Supply, Demand and Use in Artisanal and Small Scale Gold Mining in Developing Countries and Countries with Economies in Transition](#) was attended by several members of the Global Mercury Project where they participated in various presentations. See the [UNIDO Aide Memoire](#) for information.
- September 2006. This website has been updated, be sure to check out the country profile pages. Recent additions include new videos accessible from the Movies tab. From the [Indonesia page](#), a link exists to the [Galangan Website](#); a page for sharing information regarding artisanal mining in Central Kalimantan, Indonesia. This webpage highlights the use of Geographic Information System tools for investigating the effects of ASM. It is also [available in Indonesian](#).
- August 6-11, 2006. Several talks and posters were presented by GMP affiliates at the [Conference on Mercury as a Global Pollutant](#) in Madison, Wisconsin, USA. Be sure to view the [Madison Declaration on Mercury Pollution with non-technical summary of principle findings](#). The [Conference Program](#) provides a record of the abstracts and lectures presented.
- July, 2006. [Environmental and health assessments summary document](#). This report characterizes presents the main findings of the GMPs Environmental and Health Assessments for Brazil, Indonesia, Lao PDR, Sudan, Tanzania and Zimbabwe. Assessment of the environmental and health impacts of ASM has been one of the main objectives of the Global Mercury Project; these studies have provided baseline data and will ensure that further GMP activities are properly targeted.

- Several presentations were made by Global Mercury Project members at the II FORO INTERNACIONAL SOBRE LA MINERIA DEL ORO EN PEQUEÑA ESCALA, hosted in Guayana, Venezuela in mayo 2006. These presentations are in Portuguese and are available for viewing from the [Venezuela documents page](#).
- January 2006. [Global Mercury Project NEWSLETTER N°6](#) // [Newsletter Archive](#)
- [Activities of the GMP in Brazil](#) (Portuguese)

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About the GMP

The Global Mercury Project (GMP) began in August 2002 with a vision to demonstrate ways of overcoming barriers to the adoption of best practices and pollution prevention measures that limit the mercury contamination of international waters from artisanal and small-scale gold mining (ASM). Six countries have been formally participating in the GMP: Brazil, Lao PDR, Indonesia, Sudan, Tanzania and Zimbabwe. The GMP aims to introduce cleaner technologies, train miners, develop regulatory mechanisms and capacities within Government, conduct environmental and health assessments (E&HA) and build capacity within participating countries which will continue monitoring Hg pollution after the project.

Ultimate Goals of the present GEF/UNDP/UNIDO project

1. to reduce mercury pollution of international waters by emissions emanating from small-scale gold mining,
2. to introduce cleaner technologies for gold extraction and to train people in their application,
3. to develop capacity and regulatory mechanisms that will enable the sector to minimize mercury pollution,
4. to introduce environmental and health monitoring programmes,
5. to build capacity of local laboratories to assess the extent and impact of mercury pollution.

Initial Project objectives

- **Objective 1A** Establishment of a UNIDO- based Program Co-ordination Unit (PCU) and a Global Project Task Force
- **Objective 1B** Establishment of the programme management structures in each of the six participating countries (Brazil, Indonesia, Lao PDR, Sudan, Tanzania, Zimbabwe)
- **Objective 2** Identify project demonstration sites and organize training in technology and raising awareness of miners, Governments, NGOs and the general public.
- **Objective 3** Assess the extent of environmental (mercury) pollution in surrounding water bodies and devise intervention measures.
- **Objective 4** Establish a data-bank comprising of technological requirements relevant to artisanal gold mining and extraction activities.
- **Objective 5** Demonstrate within the project demonstration sites, the application of affordable high-efficiency clean technology.
- **Objective 6** Develop country specific policies and legislation that will lead to implementable standards on the application of mercury.
- **Objective 7** Promote the dissemination of the produced project results and identify opportunities that will allow the project to continue beyond the three year time frame.

Long-term Objectives

The long-term objective of this project is to protect international waters from mercury pollution emanating from small-scale mining operations. Measures and methods to reduce this pollution will be demonstrated in a pilot suite of developing countries located in several key transboundary river/lake basins. The main tools for reducing the pollution consist in assessing the extent of mercury pollution from current activities, introducing cleaner gold mining and extraction technology that minimize or eliminate mercury releases and developing capacity and regulatory mechanisms that will enable the sector to minimize negative environmental impacts.

Broad Development Objective

The broad development objectives of the six participating countries is to transform the current artisanal mining activities into organized activities in order to enhance incomes of the participating members of the population, minimize negative environmental impacts and enhance development of the mineral sector and hence the economy. Like in many developing countries, artisanal mining activities are carried out in the six participating countries mainly as a way of dealing with poverty by the rural populations. Its popularity is enhanced by the fact that its entry does not require much investment and in most cases it operates outside the formal business procedures. With little or no mining knowledge, minimal investment capital and poor legislative frameworks, most activities are unorganized, unregulated and their formal recognition is only recent following the new international drive to fight poverty. As a result, the short-term gains envisaged by miners in order to break away from poverty have largely been outweighed by the negative impacts caused by these activities to the environment, health and safety of the miners and the neighboring communities. In addressing the negative environmental impacts resulting from these activities, some Governments have initiated programmes to address the issues related to the uncontrolled use of mercury in the recovery of gold. However, since most activities have been operating outside the legal framework, major efforts are still directed towards putting in place legislative and regulatory frameworks upon which artisanal mining activities can be conducted.

Global Environmental Objective

The global environmental objective is to assist developing countries create conditions necessary to minimize mercury pollution and other negative environmental impacts on International Waterbodies resulting from artisanal gold mining and extraction activities. Most artisanal gold mining activities within the participating countries are carried out within basins of major ecological significance and that cross geographical boundaries to many countries, e.g., the basins of the Amazon, River Nile, Lake Victoria, River Zambezi, River Mekong and River Kahayan in Indonesia. As such, the negative environmental impacts on the International Waterbodies within these basins are bound to affect many countries most of which do not even have gold mining activities. Whereas the Amazon Basin is the largest drainage system in the world with more than two thirds of its area covered by an immense Amazon Rain Forest which represents about half of the Earth's remaining rain forest and constitutes the largest reserve of biological resources, estimates show that gold mining activities dump nearly 130 tons of mercury annually within Brazil alone. Nearly 200 tons of mercury is dumped into the environment by these activities in Indonesia and the amount is on the rise in other countries due to the increase in artisanal gold mining activities. The Governments of the participating countries, acting unilaterally are unable to finance the high initial start up costs of dealing with mercury related pollution problems. The proposed project will lead to the establishment of the extent of mercury pollution, increase of knowledge and awareness on environmental issues, introduction and demonstration of the application of efficient and clean technology and provision of assistance to Governments to enable them develop policies and legislation that are practical and enforceable. These efforts will in turn lead artisanal mining activities that are efficient and environmentally acceptable.

[Project Inception Document \(PDF\)](#)



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Organization

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The diagram below explains the people and agencies involved in the Global Mercury Project; for contact information or to read about the people and agencies involved use the following links.

[UNIDO Coordination Team](#)

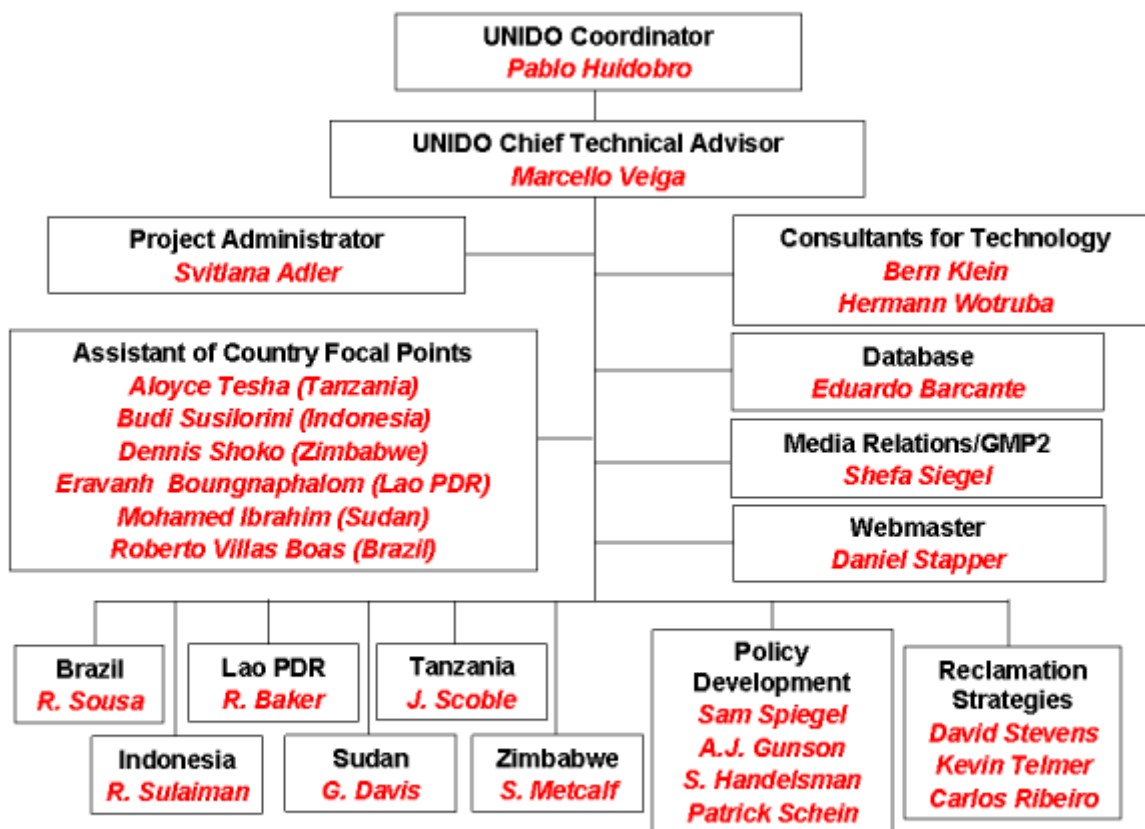
[UNIDO Representatives for participating Countries](#)

[Country Focal Points](#) - government officials working as country project managers

[Assistants to Country Focal Points](#) - individuals responsible for project supervision

[Global Environment Facility](#)

[United Nations Development Programme](#)





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ORGANIZATION

United Nations Industrial Development Organization



The Global Mercury Project Coordination team

Mr. Pablo Huidobro is the Chief of the Water Management Unit at UNIDO, and he oversees the International Waters programmes and activities, with overall responsibility for the GMP. Mr. Huidobro is a hydro-geologist, with a graduate degree in Coastal Geology. He joined the Cleaner Production and Environmental Management Branch of UNIDO in 2000, bringing over 25 years of field and managerial experience as environmental advisor for industry, international development organizations, and government agencies, in the areas of cleaner production, management and control of environmental contamination and remediation, solid waste management, and planning for the sustainable development of natural resources.

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Dr. Marcello Veiga is a metallurgical engineer with MSc degree in Environmental Geochemistry and PhD in Mining and Mineral Processing Engineering. He has worked for the past 25 years, as a metallurgical engineer and environmental geochemist for mining and consulting companies in Brazil, Canada, US, Venezuela, Chile and Peru. He has worked extensively on environmental, social and economic issues related to artisanal gold mining in numerous Latin American and African countries. As an associate professor of the Department of Mining Engineering at the University of British Columbia, Canada, since 1997, his research topics include: sustainable development in mining, mine closure and reclamation, remedial procedures for mercury pollution, adverse effects of metals and mineral processing. From August 2002 to July 2004, he was the Small-scale Mining Expert of the GEF/UNDP/UNIDO Global Mercury Project. Since March 2005 he is the Chief Technical Advisor of the project.

E-mail: veiga@mining.ubc.ca



Ms. Svitlana Adler has obtained her BA in Management/Business Administration from the International University of Vienna, Austria in the year of 2000. She joined UNIDO in July of 2003 as a Project Assistant in the Industrial Promotion and Technology Branch, where she gained valuable skills and experience by assisting the Industrial Development Officers in the implementation and administration of project activities in the areas of Technology Transfer, Market Access, Trade Facilitation Support and Increase of Productivity and Quality in developing countries. She now assists the Project Coordination Unit of the Global Mercury Project in the



coordination unit of the Global Mercury Project in the day-to-day project activities that involve budget schedule and control, recruitment of project personnel, procurement and subcontracting activities in six participating countries, organization of awareness campaigns, workshops, trainings and meetings.

E-mail: S.Adler@unido.org





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ORGANIZATION

UNIDO representatives for participating countries

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ORGANIZATION

Country Focal Points

Country Focal Points are senior government officials working as country project managers and responsible for project reporting.

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ZIMBABWE

Mr. Titus Nyatsanga
Director
Mining Promotions and Development
Ministry of Mines and Mining Development



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ORGANIZATION

Assistant to Country Focal Point

Assistants to the Country Focal Points are responsible for project supervision and reporting, as well as to arrange meetings and workshops.

INDONESIA

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LAO PDR

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SUDAN

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ORGANIZATION

Global Environment Facility



The [Global Environment Facility](#) forges international cooperation and finances actions to address six critical threats to the global environment: biodiversity loss, climate change, degradation of international waters, ozone depletion, land degradation, and persistent organic pollutants.

The [Global Mercury Project](#) is one of the UNDP-GEF projects in the [international waters focal area](#). GEF projects to reverse the degradation of international waters are informed by—and help to realize the objectives of—a mosaic of regional and international water agreements. These projects enable countries to recognize and learn more about the water-related challenges they share, find ways to work together, and undertake important domestic changes needed to solve problems. The three categories of water projects are 1) water bodies; 2) integrated land and water projects; and 3) contaminants.



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United Nations Development Programme



The [United Nations Development Programme](#) (UNDP), the development arm of the United Nations, was designated by the [Global Environment Facility](#) (GEF) as one of its three Implementing Agencies. With its special mandate from the United Nations General Assembly and global conventions, UNDP works to advance the UN agenda on development. By drawing extensively on its broad network of country offices and country contacts, special knowledge of development issues, thematic expertise and country-specific experience, UNDP assists countries to achieve their development goals. UNDP provides support to countries in the development of effective policies and institutions, such as integrating environmental and development objectives into national development agendas and processes, to protect the environment as well as reduce poverty.

The Global Mercury Project is one of the UNDP-GEF projects in the [international waters focal area](#). These projects aim at achieving a comprehensive, ecosystem-based approach to the sustainable management of international waters, incorporating both developmental and ecological needs.



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Countries

The selection of countries was based primarily on the use of mercury for artisanal mining and the associated impacts on water bodies of global significance. The initial participating countries are Brazil, Sudan, Tanzania, Indonesia and Laos - follow the links below the map to their respective pages where information specific to those countries can be viewed. Additional countries where the Global Mercury Project has been working in various extents are Guyana, [Venezuela](#), Guinea, [Ghana](#), Mozambique, Suriname, the [Philippines](#) and [Zimbabwe](#). Below the map, main regions where artisanal mining is spreading - [South America](#), [Africa](#) and [Asia](#) are briefly discussed with reference to international water bodies being affected by artisanal gold mining. At the bottom of this page a [table](#) displays annual gold recovery and mercury emissions from a few of the mining sites the Global Mercury Project has been working with.



[Brasil](#) [Sudan](#) [Tanzania](#) [Zimbabwe](#) [Indonesia](#) [Lao PDR](#)

South America - The Amazon Basin

The Amazon Basin is the largest drainage system in the world with an area of about 6 million square kilometres. The Amazon River has a total length of 6400 kilometres, which is slightly shorter than the Nile. Stretching almost 2760 kilometres from north to south at its widest point, the Basin occupies a great part of Brazil and Peru, significant parts of Columbia, Ecuador and Bolivia and a small area of Venezuela. Almost two-thirds of the Amazon's main streams and by far the largest portion of its Basin are within Brazil. More than two thirds of the Basin is covered by an immense Amazon Rain Forest which represents about half of the Earth's remaining rain forest and constitutes the largest reserve of biological resources. Artisanal gold mining activities in the area are probably the most in the world with one of the largest area, Tapajos in the Para State occupying an area of up to 2.9 million hectares. At the peak of the gold rush in the 1980s, it was estimated that nearly 1.0 million people were directly involved in the activities, with 400,000 of those being in the Tapajos area alone. Available documentation shows that nearly 1,000 tonnes of mercury were dumped into the Amazon Basin during the 1980s and nearly 130 tonnes are currently dumped annually.

Africa - River Nile Basin, Lake Victoria, Zambesi River

Within the participating countries of the African Region, the significant International Water-bodies include the Nile River system, Lake Victoria and the Zambezi River system. The Nile River system is composed of the Blue Nile (Abbai) River that originates from Lake Tana and the White Nile that rises from Lake Victoria. Sudan occupies a major part of the River Nile basin. Along its course (6825 km), the Nile drains a total area of 2.96 million

River Nile basin. Along its course (6825 km), the Nile drains a total area of 2.70 million square kilometres from the Equator up to the Mediterranean coast in Egypt. Areawise, the Nile basin represents one tenth of the African continent. Mining along the Nile covers nearly 2,000 km² in the Southern Blue Nile region with mine workings developed in old river terraces along the riverbanks and its tributaries at the foothills of the Ethiopian highlands. It is estimated that nearly 120,000 people are engaged in these activities. On the other hand, Lake Victoria which has an area of more than 70,000 km² is Africa's largest lake and second largest in the world only to North America's Lake Superior. The Lake, which is surrounded by one of the most highly populated areas in the world and is shared by Tanzania (51% of the Lake area), Uganda (43%) and Kenya (6%), is a source of employment for nearly 30 million people. The Lake Victoria Goldfields which cover almost 200,000 km² is estimated to employ nearly 300,000 people and produce nearly 70% of the country's total gold production. Nearly 12 tonnes of mercury are released to the environment in Tanzania alone. More than 50% of artisanal gold panning activities in Zimbabwe are carried out within the Zambezi River system (more than 2400 kilometres are panned) and its tributaries. The Zambezi flows along the northern and Southern borders of Zimbabwe and Zambia respectively before cutting across central Mozambique on its way to the Indian Ocean. There are about 350,000 gold panners in the country with as many as 300 panners concentrated in every kilometre of the widely panned sections of the Zambezi River system river and releasing nearly 12 tonnes of mercury annually to the environment. Within the six participating countries, nearly 2.0 million people are directly involved in artisanal mining activities and a number of those whose livelihoods depend on these activities in one way or another is over 10 million.

Asia - Kahayan River, River Mekong

River Mekong in Laos and River Kahayan in Central Kalimantan, Indonesia are the significant International Waterbodies within the Asian participating countries. The River Mekong which is about 4,500 kilometres long and is a life-stay for almost 50 million people and their cultures sets out at the Qinghai plateau in Western China before flowing into Laos, Myanmar, Thailand, Cambodia and Vietnam. Although the upper portions of the river are characterized by turbulence, the lower Mekong is more placid, and the annual flooding supports a biologically diverse ecosystem. In Laos, alluvial mining activities are carried out as seasonal activities during the dry non-agricultural season mainly by dredging on the River Mekong and its tributaries. Up to 3,000 miners have been found at any one time working on River Mekong. The Kahayan River, is the largest river in Central Kalimantan and drains directly into the Java sea and thus with effects to Singapore, the Islands of Sumatra, Java, Bali and others. Most activities are based on alluvial operations within the river systems with a few mining hard rock gold veins. However, even those in hard rock mining transport the ore to the rivers for processing. The Kahayan River in Central Kalimantan and the Tapan River in North Sulawesi are known to have a high concentration of miners per kilometre length. It has been reported that more than 2,000 illegal miners would converge on single mining site following a reported gold recovery. In Indonesia where artisanal gold mining activities are carried out either through village cooperative units or through illegal operations and are found in the provinces of West and Central Java, Sumatra, Central and East Kalimantan, North Sulawesi and others, nearly 180 tonnes of mercury are released to the environment annually.

GMP sites	Au produced (t/a)	Hg lost (t/a)
Brazil		
São Chico	0,02	0,035
CrepORIZINHO	0,3	0,4
Indonesia		
Galangan	0,3	2
Talawaan	0,3	20
Luang Prabang, Laos	0,004	0,0025
Blue Nile, Sudan	0,3	0,14
Rwamagasa, Tanzania	0,02	0,027
Kadoma, Zimbabwe	2	9



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Venezuela



COUNTRY FOCAL POINT: N/A

ASSISTANT TO COUNTRY FOCAL POINT:
N/A

PROJECT SITE: El Callao, Bolivar State



DOCUMENTS

[Unidades de Demonstración y Campaña de Educación para Mineros Artesanales de Oro.](#)

II FORO INTERNACIONAL SOBRE LA MINERIA EN PEQUEÑA ESCALA, ESTADO BOLIVAR, VENEZUELA Author: Marcelillo Veiga (12-13 de mayo, 2006)

[Introducción de Tecnologías Limpias en la Minería Artesanal de Oro.](#) II FORO INTERNACIONAL SOBRE LA MINERIA DEL ORO EN PEQUEÑA ESCALA. Ciudad Guayana, Venezuela. Author: Pablo Huidobro, ONUDI (12-13 de mayo 2006)

[Mercurio y Enfermedades Inmunológicas en Comunidades de Minería Artesanal de Oro: Una Interacción Peligrosa?](#) II FORO INTERNACIONAL SOBRE LA MINERIA EN PEQUEÑA ESCALA. Author: Janis Shandro, Dept Mining Engineering University of British Columbia (12-13 de mayo 2006)

[Contaminación por mercurio en la minería artesanal en el Bloque B de El Callao: Evaluación de la salud.](#) II FORO INTERNACIONAL SOBRE LA MINERIA EN PEQUEÑA ESCALA. Author: R. Darío Bermúdez Tirado, UNIDO (12-13 de mayo, 2006)

[Mercurio y Cianuro en Minería Artesanal de la Provincia de El Oro, Ecuador Ing.](#) Author: Patricio C. Velásquez, UNIDO and University of British Columbia. (12-13 de mayo, 2006)

[Mercury Pollution from Artisanal Gold Mining in Block B, El Callao, Bolivar State, Venezuela: Health and Technological Assessment.](#) Authors: Marcello M. Veiga, Vienna Dario Bermudez, Heloisa Pacheco-Ferreira, Luiz Roberto Martins Pedroso, Aaron J. Gunson, Gilberto Berrios. (May, 2004).

[Mercury Pollution from Artisanal Gold Mining in Block B, El Callao, Bolívar State, Venezuela](#) in: Dynamics of Mercury Pollution on Regional and Global Scales: Atmospheric Processes, Human Exposure Around the World, p. 421-450. N. Pirrone & K. Mahaffey (Eds), July 2005, Springer Publisher, Norwell, MA, USA. Contributors: Marcello M. Veiga, Dario Bermudez, Heloisa Pacheco-Ferreira, Luiz Roberto Martins Pedroso, Aaron J. Gunson, Gilberto Berrios, Ligia Vos, Pablo Huidobro, Monika Roeser. (July, 2005)

[Mercury Bioaccumulation by Aquatic Biota in Hydroelectric Reservoirs: Review and Consideration of the Mechanisms: The Guri Case, Bolivar State, Venezuela.](#) Paper presented at the 1st International Forum on Mercury Problems in Hydroelectric Reservoirs, 2001. Authors: Marcello M. Veiga and Jennifer Hinton, Dept. Mining & Mineral Process Engineering, University of British Columbia. (2001)

[Advisory Assistance on Avoidance of Mercury Pollution from Artisanal Gold Mining operations in Bolivar State, Venezuela.](#) Author: Marcello M Veiga. March, 1996.

VENEZUELA

The southern part of Venezuela, below the Orinoco River, involving State of Bolivar, State of Amazonas and the Federal Territory of Delta Amacuro is called Guayana Region. The main mining activities are conducted in the State of Bolivar which has an area of 240,528 km², comprising 75% of the hydroelectric potential of the country. The number of inhabitants in Venezuela reaches some 24.2 million with a population density of 26.4 persons per km². In 2000, 87% of the population lived in cities and towns with more than 2,500 inhabitants. Less than 5% of the population lived in the Guyana Region. In 1999, the labor force experienced 1.1% decrease in number resulting in an unemployment rate of 13.2% (1,365,752 people). In 2000, 63% of the individuals making up the workforce were men. Unemployment among men reached 12.5%, 1.1% higher than 1999. In 2000, 14.4% of women did not have a job. This was 1.7% higher than in 1999. In the Bolivar State, with a population of 1,214,486, there are about 15,000 people⁴ directly involved in artisanal and small-scale gold mining. The number of artisanal miners and its gold production has been declined since most artisanal miners working in dredges in the Caroni River have been removed since 2000 and many parts of the river are now flooded by four large hydroelectric reservoirs. Many artisanal miners are now concentrate in km 88 and El Callao, which is a traditional artisanal mining site. El Callao is located in the Northeastern part of the State of Bolivar, 150 km distant from Ciudad Guayana. Gold was discovered in El Callao in 1865 and in 1870 a company was established to produce gold. In 1970, CVG (Government owned company) incorporated a company, Minerven, which nowadays has two cyanidation plants producing together approximately 200 to 300 kg of gold/month: Peru Plant processing 5,200 tonnes of material/month and Caratal plant processing 14,000 tonnes/month. About 15% of the Peru Plant material is Hg-contaminated tailings purchased by the company from the artisanal gold miners.

The area with high concentration of artisanal gold miners in El Callao is known as "Block B" which belongs to CVG-Minerven that rents concessions to small-scale mining individuals/companies. Miners extract the ore from 30-80 m deep shafts using explosives and transport it in small trucks to the Processing Centers (locally known as "molinos") to be crushed, ground, concentrated and amalgamated. Based on the average gold production, the Block B production might be around 1 to 2 tonnes Au/a considering that there are 28 active Processing Centers in the area. In all El Callao, the gold production can reach as much as 5 to 6 tonnes Au/a considering that there are 80 to 90 Processing Centers in all region. By using copper-amalgamating plates to amalgamate the whole ground ore, large amount of mercury is lost with the tailings. The amalgam recovered from the plate is burned on a tray or a shovel. Some millers have good retorts available for miners but the miners insist that the retorting time is too long (15 minutes) and they simply use a propane blowtorch to decompose amalgam, emitting large amount of mercury to the atmosphere and exposing themselves to mercury vapor. This is clearly contaminating everyone directly involved in the ore processing as well as their neighbors, since the Processing Centers are very near the houses. The ratio Hglost: Au produced is around 1.5 to 2. The mercury emission in Block B is estimated to be between 2 and 4 tonnes/a. In all El Callao, the mercury emission can reach as much as 12 tonnes/a.

The levels of mercury intoxication of the gold miners and millers working in the Block B, El Callao, Venezuela, is one of the most serious in the world. More than 90% of the sampled individuals working in the Processing Centers (millers) have Hg levels in urine above the alert level (5 µg Hg/g creatinine). . Symptoms typically associated with chronic exposure at very high levels of mercury, acute intoxication, long term exposure at low levels of mercury vapors and long term exposure at high levels of mercury vapors (e.g. muscular tremor) were identified in Block B workers and residents. As a result of indirect exposure

of mercury vapors, it was observed that about 27% of the women have Hg concentration in urine above the alert level and 21% above the action level. About 53% of the 62 children sampled have Hg concentration in urine above the alert level and 14.5% above the action level (20 µg Hg/g creatinine). Almost 10% of the sampled children have levels of mercury in urine above 100 µg/g creatinine.

It is urgent the introduction of methods to reduce the use of mercury in the gold processing phase, such as gravity concentration, to eliminate the large loss of Hg to the environment due to the use of copper-amalgamating plates. Protection for individuals is also urgent. Different types of retorts must be brought to the miners' attention to reduce occupational exposure and emission of Hg vapor.



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Ghana



COUNTRY FOCAL POINT: N/A

ASSISTANT TO COUNTRY FOCAL POINT:
N/A

PROJECT SITE: N/A



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[UNIDO's Strategy for Reducing the Impact of Artisanal Gold Mining on the Health and the Environment: Study case in Ghana.](#) Author: Ludovic Bernaudat, UNIDO.

[Assistance in Assessing and Reducing Mercury Pollution Emanating from Artisanal Gold Mining in Ghana - Phase I.](#) UNIDO Project Report and Phase 1. Project Manager: Ch. Beinhoff. December, 2003.

[Assistance in Assessing and Reducing Mercury Pollution Emanating from Alluvial Gold Mining in Ghana - Phase II.](#) Project Manager: Ch. BEINHOFF.



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Philippines



COUNTRY FOCAL POINT: N/A

ASSISTANT TO COUNTRY FOCAL POINT: N/A

PROJECT SITE: Naboc River, Davao del Norte and
Hijo River, Apokon in Mindanao



DOCUMENTS

[Assistance in Reducing Mercury Emissions in Highly Contaminated Gold Mining Areas in Mindanao - Phase 1](#). UNIDO in partnership with the Department of Environment and Natural Resources. April 1998

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Zimbabwe



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PROJECT SITE

Zambezi River



DOCUMENTS

[Zimbabwe Final Report](#)

[Environmental Assessment for the Kadoma-Chakari mining area, Zimbabwe.](#) P. Billaud, V. Laperche, R. Maury-Brachet, A. Boudou, D. Shoko, S. Kahwai, Ph. Freyssinet.
September 2004

[Health Assessment for the Kadoma-Chakari mining area, Zimbabwe.](#) Stephan Boese-O'Reilly, Felicitas Dahmann, Beate Lettmeier, Gustav Drasch. *November 2004*

[Information about the Project Sites in Zimbabwe](#) Dennis S. M. Shoko, PhD, Assistant to Country Focal Point; Marcello M. Veiga. *January 2004*

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PHOTOS FROM ZIMBABWE







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Brazil



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PROJECT SITES

Tapajós Reserve / Amazon Basin

WEB SITE

<http://www.cetem.gov.br/gmp/>

DOCUMENTS

[Brazil Final Report](#)

[Guide do seu Tesouro](#) (in Portuguese) is a animated brochure that is full of great tips for miners that are in contact with and/or are using mercury for amalgamating their gold. Credit: AMOT, São José Liberto, Guto Alves.

In October 22-28, 2006, a group of GMP representatives met with gold miners from the Tapajós river basin in Creporizão, Pará, Brazil. The week long training event was titled "Guide do seu Tesouro" or Care for your treasure; this was a very successful mission to educate miners and encourage appropriate mining techniques. The [Aide Memoire](#) describes the goals and objectives of the training and includes the schedule and a list of participants. A [picture document](#) has been assembled by the coordinator, Rodolfo Neves.

[Delineation of the Permanent Preservation Areas in the Tapajós River Basin: Toward Environmental Compliance on Artisanal Gold Mining Areas.](#) Author: Carlos Antonio Alvares Soares Ribeiro (August 2006)

[The challenge for Tapajos Garimpos](#)
Alberto Rogério Benedito da Silva

[Environmental and health assessment in two small-scale gold mining areas – Brazil](#)
São Chico and Creporizinho - Final Report
Saulo Rodrigues Pereira Filho April 2004

[Sociological Report for Brazil](#)
Armin Mathis July 2003

[Information on Project Sites in Brazil](#)
Roberto C. Villas-Bôas November, 2003

PHOTOGRAPHY FROM BRAZIL





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Sudan



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PROJECT SITE

River Nile Basin



DOCUMENTS

Sudan Final Report

[Environmental Assessment for the Ingessana Hills artisanal gold mining community, Blue Nile State, Sudan.](#) (Draft Report) G. Récoché, JP. Ghestem, I. M. Suleiman, R. Maury-Brachet, V. Roques-Duflo and A. Boudou. *March 2005.*

[Equipment Specification for the Demonstration Units in Sudan](#) Marcello Veiga, PhD, Small-scale Mining Expert, Vienna, Austria. *May 2004*

[Socio-economic sample study of the Ingessana Hills artisanal gold mining community, Blue Nile State, Sudan](#) Prof. Khalil A. Al Medani, University of Nileen, Khartoum, Sudan. *December, 2003*

[Information about Ingessana Hills artisanal gold mining sites chosen for the environmental & health assessment](#) Mohamed S. Ibrahim, Assistant to Country Focal Point. *November, 2003*

PHOTOS FROM SUDAN







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Tanzania



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PROJECT SITE

Lake Victoria



DOCUMENTS

Tanzania Final Report

[Final Report for an Assessment of the Environment and Health in the Rwamagasa area, Tanzania](#)

J D Appleton, H Taylor, T R Lister & B Smith (British Geological Survey); G Drasch & S Boese-O'Reilly (Institute of Forensic Medicine, Ludwig- Maximilians-University, Munich). 2004

[Information about the Project Site \(Rwamagasa, Geita District\) in Tanzania](#)

Marcello Veiga, PhD, Small-scale Mining Expert, Vienna, Austria. February, 2004

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[Socio-economic survey of Rwamagasa mining site in Geita district](#)

Susan Wagner. July, 2003

[Information about the Project Site in Tanzania](#)

Aloyce L. Tesha, Assistant Country Focal Point. November, 2003

[Introducing New Technologies for Abating Mercury Pollution Caused by Informal Gold Mining Operations in Tanzania](#), UNIDO Project Document for the Tanzanian Government, 1997

PHOTOS FROM TANZANIA







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Indonesia



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PROJECT SITES

Galangan - Central Kalimantan [VISIT GALANGAN WEBSITE HERE](#)

Talawaan - North Sulawesi

DOCUMENTS

[Indonesia Final Report](#)

[Newsletters from Kalimantan](#). These newsletters provide a look at work being done in association with the Global Mercury Project around the community of Kereng Pangli, Central Kalimantan. The newsletters are available in English as well as Indonesian. The team in Kalimantan includes Bardolf Paul, Sumali Agrawal, Dzul Fikri Al Huda, Mayang Meilantina and Kartie Vitamerry.

Issue 1: August, 2006 [English](#) [Indonesian](#)

Issue 2: October 2006 [English](#) [Indonesian](#)

Issue 3: December 2006 [English](#) [Indonesian](#)

[Environmental and health assessment in two small-scale gold mining areas – Indonesia Sulawesi and Kalimantan: Final Report](#) Saulo Rodrigues Pereira Filho, Project Leader. Institute of Forensic Medicine, Ludwig-Maximilians University, Munich, Germany; Brazilian Ministry of Science and Technology Centre For Mineral Technology (CETEM). (July 2004)

[Environmental Assessment in two Small Scale Gold Mining Areas in Indonesia- Biogeochemical](#)

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[Information about the Project Sites in Indonesia](#) Marcello Veiga, PhD, Small-scale Mining Expert, Vienna, Austria. (May, 2003)

[Overview of project site in Indonesia Talawaan and Galangan areas](#) Selinawati T. Darmutji, Assistant to Country Focal Point. (December, 2003)

PHOTOGRAPHY FROM INDONESIA





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Lao PDR



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PROJECT SITE

River Mekong



DOCUMENTS

[Lao PDR Final Report](#)

[Environmental Assessment for the Pak Ou and Chomptet districts of Lao PDR.](#) Ph. Freyssinet, S. Vilaypaseuth, V. Laperche, M. Babut. *November 2004*

[Health Assesment in the Pak Ou and Chomptet districts of Lao PDR.](#) André Rambaud, Florence Portet, Tayphasavanth Fengthong, Vanphanom Sychaleun. *December 2004*

[Sociological Survey for Luang Prabang Artisanal Gold Mining Areas,](#) Prepared by Earth Systems Lao. *October, 2003*

[Information about the Project Sites in the LAO PDR.](#) Eravanh Bounnaphalom, Assistant to the Country Focal Point. *October, 2003*

PHOTOGRAPHY FROM LAOS







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Movies

Four movies are currently available for viewing. Depending on internet connection speed, it is recommended to download movies prior to viewing. Right-click on the links and use the 'Save Target as' command to download them to your computer.

Gold in the Amazon is a 30 minute movie about Garimpo gold mining in the Amazon. It describes the methods that have and are still used to mine gold from alluvial sediments and introduces the environmental issues caused by these methods. The movie is provided in MOV format (click picture links) and MP4 format (click text links). It has been split into 6 chapters to facilitate downloading and viewing.



[Chapter 1](#)



[Chapter 2](#)



[Chapter 3](#)



[Chapter 4](#)



[Chapter 5](#)



[Chapter 6 / 6](#)

[Artisanal Gold Miners in Kourossa and Mandiana, Guinea, Africa](#)

The footage presented in this video was filmed in April of 2006 by Marcello Veiga on a mission to Guinea sponsored by the Blacksmith Institute and UNIDO. It presents the methods being used in Guinea to mine for ore and concentrate gold.

[GMP Training of Gold Miners in Geita, Tanzania 2006.](#)

Another short film that provides a visually and acoustically delightful account of the training provided for the Geita mining community in Tanzania. Made with thanks to Mr. A. Tesha, Giorgina Cattenea, Juliet Kabege, Halid Kiluvya, Rogers Sezinga and the Geita gold miners and trainers.

[Tapajos Region Brazilian Amazon Artisanal Gold Mining June 2006](#)

This short video was filmed in June of 2006 around the Gold mining community of Creporizao, Para Brazil. Footage includes a Bahanco operation using sluices to concentrate alluvial gold as well as current attempts to reforest previously mined areas.



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- [Lao PDR](#)
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Be sure to visit the [Global Mercury Project Database](#) where articles and reports about mercury in artisanal mining are available

Original GMP Proposal

[GEF/UNDP/UNIDO - GMP Project Inception Document \(April 2002\)](#)

Final GMP Reports

- [Summary report: Technical and socio-economic profiles of Global Mercury Project sites \(May 2004\)](#)
- [Environmental and health assessments: Summary document \(July 2006\)](#)
- [Report to UNEP on global impacts of mercury supply and demand in small-scale gold mining \(Feb. 2007\)](#)
- [Review of mercury and cyanide uses in the artisanal gold mining \(May 2007\)](#)
- [U.N. international guidelines on mercury management in artisanal and small-scale gold mining \(June 2007\)](#)
- [Report on the policy and governance initiative \(July 2007\)](#)
- [Evaluating and monitoring small scale gold mining and mercury use: Building a knowledge-base with satellite imagery and field work \(Nov. 2007\)](#)
- [The role of fair trade for the mercury emissions reduction plan in ASM gold mining \(Dec. 2007\)](#)
- [Summary of the results of the awareness campaign and technology demonstration for artisanal gold miners: Brazil, Indonesia, Lao PDR, Sudan, Tanzania and Zimbabwe \(April 2008\)](#)

Books

- [Introducing New Technologies for Abatement of Global Mercury Pollution in Latin America](#)
Authors: Marcello M. Veiga - UNIDO/UBC/CETEM/CNPq, (1997)
- [Protocols for environmental and health assessment of mercury released by artisanal and small-scale gold miners](#)
Authors: Marcello M. Veiga and Randy F. Baker (2004)
- [Manual for training artisanal and small-scale gold miners](#)
Authors: Veiga M, Metcalf S, Baker R, Klein B, Davis G, Bamber A, Siegel S, Singo P (2006)

Presentations

- [Retorts: Many options and many barriers](#)

Author: Marcello Veiga. (2005)

- [Economic aspects of reducing mercury pollution in artisanal gold mining](#)
The presentation was given by Simon D. Handelsman and Dr. Marcello Veiga at the Canadian Institute of Mining Annual Meeting in Vancouver (May 2006)
- [Mercury and small scale gold mining - magnitude and challenges worldwide.](#)
Presentation given by Dr. Kevin Telmer to the International Conference on Managing the International Supply and Demand of Mercury, in Brussels.
Author: Kevin Telmer (October 2006)

Brochures

- [Less Mercury, More Gold, and Better Health \(GMP\)](#)
Author: Marcello Veiga (November 2005)



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Resources and related Organizations

The **Global Mercury Forum** is online at www.globalmercuryforum.org

United Nations Environment Programme [Global Mercury Assessment Report](#). For more information visit <http://www.chem.unep.ch/mercury/>

[FACOME](#) - Amazonian Forum on Mercury Contamination of Ecosystems (in Portuguese, French and English)

[CASM](#) - Communities and Small-Scale Mining is an initiative to reduce poverty by supporting integrated sustainable development of communities affected by or involved in artisanal and small-scale mining in developing countries. <http://www.casmsite.org>

[CIFEG](#) - International Center for Training and Exchanges in Geosciences

[COMERN](#) - Collaborative Mercury Research Network

An ecosystem approach for the study of mercury pathways in the Canadian environment

[GECO](#) - South American based group dedicated to sharing information relating to mercury and Artisanal Mining (previously known as Hg-net)

[US Environmental Protection Agency Mercury Web Site](#) - An general but extensive mercury knowledge resource.

[The Mercury Policy Project](#) - This NGO promotes policies to eliminate mercury uses, reduce the export and trafficking of mercury, and significantly reduce mercury exposures at the local, national, and international levels. It is updated regularly.