Wounding Guyana: Gold Mining and Environmental Degradation

Lomarsh Roopnarine

Guyana’s National Development Strategy (NDS) states that all aspects of the country’s development are to be guided by serious environmental considerations. This ‘environmental principle’, however, has not been practiced efficiently, particularly regarding the regulation of the gold mining sector. Gold mining activities in Guyana have caused waste pollution, river contamination through cyanide and mercury use, soil erosion, deforestation, and destruction of wildlife. The government of Guyana is cognizant of these environmental malaises, but its weak capacity and consistent mismanagement impairs its ability to effectively monitor and control this sector. The government’s weaknesses put the country’s 750,000 inhabitants, including 40,000 interior Amerindians, at direct risk. Many directly depend on the environment for their livelihood.

Gold mining is an interior affair, which is overseen by the Guyana Geology and Mines Commission (GGMC) and the Guyana Environmental Protection Agency (EPA). These agencies are supported by a host of international environmental agencies, including Conservation International, United Nations Development Programme, Canadian International Development Research Center, Iwokrama Rainforest Program, and a German Technical Assistance Agency. Yet, the GGMC and the EPA are ill prepared and ill equipped to carry out their mandated responsibilities. Guyana’s environmental capacity is characterized by ‘mismatch.’ The relevant agencies have been assigned responsibilities that they do not have the resources to carry out. They are under-trained and under-funded, yet are charged with a staggering range of responsibilities. Further, the government has proven reluctant to delegate any real power outside the Office of the President (Colchester 1997, 146). Development specialists refer to Guyana’s environmental policy problem as ‘lacking absorptive capacity’.

Guyana’s environmental policy is laggard and ad hoc, lumbering on a continuum from uncertainty to dissension. Regulatory bodies are running years behind, deadlines or not. Many monitoring facilities are old and deteriorating, presenting more problems than solutions. Environmental policy is scattered among various government institutions and are regulated under a mix of laws, orders, and directives. The result is intense frustration, serious overlaps and gaps in the regulatory requirements, and a general failure to address the problems of the mining sector. The structurally weak and inefficient administrative bodies are in a disadvantaged position to ensure and enforce preventative actions against rapacious mining practices. Guyana’s maladroit environmental policies exist because the country has been incapacitated by limited financial resources and skills, constrained by a huge
national debt (US$1.1 billion), derailed by lingering border disputes with Venezuela and Suriname, and whittled by ethnic violence, crime and mass migration (Roopnarine, forthcoming).

Further problems stem from corruption, foot-dragging, and low work morale. Since achieving independence in 1966, Guyana has been reeling from political corruption. Top government officials continue to concoct secret deals with foreign multinational companies and hand out generous mining concessions in exchange for lucrative payoffs (Stabroek News, 15 Oct 2000; Colchester 1997). In Guyana, permission to perform large-scale mining comes from the President and the ministers, and permission to perform medium and small-scale mining is given by the environmental agencies. Transactions between large companies and government officials are not generally disclosed to the public (World Bank 1993, 71).

Poor salaries and slack monitoring have made GGMC members susceptible to bribes and kickbacks. Further, many members have identified more with the miners than with the mission of their agency. It is reported to be ‘a normal practice by mines officers to allow miners to operate in closed or disputed areas for a 10 per cent cut of the gold production’ (Richards 2000a). The government has lost control over mining operations, and there are insufficient trained personnel in the hinterland region to patrol mining areas and enforce stiff sanctions against violators. Only the most grotesque cases of environmental damage are dealt with, and potentially damaging mining practices normally go unchecked. ‘Local government in the interior is either non-existent or extremely ineffective, so that foreign firms [local miners] fill a power vacuum and become de facto unofficial governments’ (Mars 1998, 68). Moreover, slack environmental policy enforcement has led to miners simply evading the law entirely. Of the 20,000 small-scale miners in Guyana, only a fraction of them declare their gold to the Guyana Gold Board. Gold smuggling is rampant via Brazil, Suriname, and Venezuela. It is reported, ‘the government gets nothing. Dredge owners are supposed to declare their finds, but usually hand out over about 10 per cent of what they get and play cat-and-mouse at police posts with the rest. The official Gold Board’s meager takings are just about enough to pay for Guyana’s impressive array of diplomatic missions’ (The Economist 1990, 42).

Increasing the current manpower in the GGMC (230 members) and the EPA (40 members), and the establishment of interior monitoring outposts, will certainly help resolve Guyana’s environmental problems, at least temporarily. However, unless stronger commitments to monitor the interior are embraced, Guyana will backslide. Guyana needs a modern laboratory to carry out metallurgical analyses, geo-chemical tests, and environmental analyses of mining waste. The results of these tests need to be transparent to the general public.

Guyana’s environmental policy record is rather poor. After a suffocating period of cooperative socialism, the Peoples National Congress (PNC) administration returned to the global economy in the mid-1980s. The administration opened Guyana’s interior to foreign and local miners to help generate foreign exchange, invigorate a cash-starved economy, and begin to deal with running trade and budget deficits. Development plans were not guided by sound ecological standards, and Guyana experienced similar environmental degradation to Southeast Asia: deforestation, catastrophic mining, river pollution, and so on. The current People’s Pro-
gressive Party (PPP) administration instituted marginal policy environmental changes, but relies on the exploitation of natural resources – gold, diamonds, and logging – for economic development. Gold production contributes about 25 per cent of the GNP (Thomas 1998). The administration was constrained by the country’s poor economic situation and addressed environmental issues in an ad hoc fashion. The government created the EPA in 1996, but this institution has not been successful in moving Guyana forward to more environmentally benign practices. The government admits there are environmental problems associated with gold mining, especially on small-scale mining projects. New guidelines have been instituted to essentially weed out illegal mining plaguing the gold industry. The government contends large mining companies have fairly good environmental practices and environmental plans, pointing out that Omai has gone for ISO 14001 certification (which has to do with quality environmental management). This assertion is not accurate since private companies do not generally work in conjunction with the government, even though large companies claim they discharge environmental responsibility with good faith. Gold mining activities, whether small or large, continue to negatively affect Guyana’s interior environment.

Small and medium size gold mining and mercury contamination

Guyana’s interior environment has experienced a worrying decline. The interior environment continues to be blasted, pulverized and run through with mercury. Amalgamation, dredging, and mud washing into rivers from mining activities have caused pollution, discoloration of waterways, and have blocked channels from sand tailing and silting. Various commentators have vividly described the effects.

Flying over the jungle, you see the appalling results wrought by freelance miners and their migrating land dredgers. Below, the forest extends, infinite and green, its tree-tops like so many heads of broccoli, sewn together. But there are gouges: white splotches in the canopy, divots out of the prima materia. Even more ruinous is the infamous river-going ‘missile’. A dredge/sluice operation set on a flatbed boat, the missile is equipped with a prong like iron pipe, that sucks up the material from the gold-bearing riverbed (Jacobson and Kratochvil 1998, 55-6).

Also:

Wide areas are cleared of trees and topsoil with chains-saws and hoses to allow access to sub-soil deposits. Mercury use has increased exponentially as the gold-mining has expanded…. What were once clear rivers flowing between forested banks became wide washes of mud and debris criss-crossed by meandering red-brown streams of water and slurry searching for a way through the tailings, with stagnant pools and a moonscape of spoil heaps and sandbanks along the banks (Colchester 1993, 70-1).

Guyana’s main waterways have become sponges for uncontrollable discharges of hazardous waste laced with mercury that undermines river banks, changes the natural flow of rivers, disturbs and destroys endangered river ecosystems, deposits poisonous tailings into waterways, and threatens established river rain communities
and other denizens in the area. Since World War II, the United States has abandoned the use of mercury to separate gold particles from river sediments (amalgamation) for economic and environmental reasons (Greer 1993, 92). The United Nations Environment Programme (1991) recommends that mercury amalgamation not be practiced because of its deleterious effects on the environment.

In Guyana small-scale miners, including legal and illegal Brazilians (Garimpeiros), engage in the amalgamation process because of economic hardships and the absence of alternative technologies. Brazilian Garimpeiros have developed a reputation in Guyana’s interior region for rapacious mining practices that ignore even the most basic environmental regulations. Worldwide, smaller scale gold mining operations dump between 400-500 tones of mercury into the environment each year. Brazilians are responsible for 90-120 tones (Greer 1993, 92). ‘In a diabolical exchange, for each pound of gold extracted from the rivers of the [Brazilian] rain forest, the miners pour as much as two pounds of toxic mercury into the environment’ (Brook 1990).

The careless use of mercury can have serious effects on animal and human health. Through the amalgamation process mercury escapes into the atmosphere as vapor and can return to earth with the rain. Mercury also escapes into land and river ecosystems and returns to humans via the food chain. Exposure to mercury poisoning causes breathing difficulties, nausea, diarrhea, rashes, insomnia, memory problems, vision loss, severe tremors, brain damage, and death (Greer 1993; Brooke 1990). Reliable data on how much mercury is used to produce gold in Guyana is not available. So far, research has been sketchy on the effects of mercury on miners and tropical interior communities. The local declaration of gold for 1999 was 110,000 ounces, while the figure for January 2002 was 8,047. It is estimated that for every pound of gold produced in Brazil, three times that amount of mercury is spilled into the environment (See De Freitas, 2001).

The symptoms of mercury use on Guyana’s interior population have begun to surface. The World Wildlife Fund, Canadian Development Agency, United Nations Development Programme and the Organization of the American States confirm the detection in Guyana’s interior of ‘significant levels of contamination among the human and wildlife population due to occupation use and residual mercury in the aquatic system’ (Richards 2001). Examination of 168 fish samples, 71 from Kurupung and 97 from Isseneru as well as human hair and urine samples from residents in these communities reveals mercury contamination beyond maximum safe limits. The normal mercury concentration in human hair is 1 ppm (parts per million), and concentrations of up to 6.4 ppm are still considered safe (Richards 2001). The World Health Organization (WHO) sets the tolerable level of mercury concentration on human hair at 6 ppm. At 10 ppm, a pregnant woman runs the risk of damaging her unborn child. At 30 ppm, the first stage of mercury poisoning starts to show (See Brooke 1990). Based on these guidelines, 89 per cent to 96 per cent of the population at Isseneru had mercury over the tolerable limits, while 12 per cent to 14 per cent of the population at Kurupung was exposed to mercury contamination. These communities are at direct risk as they depend on river water for domestic and agricultural use. Mercury discharge into the environment is usually trapped in soft sediment of rivers and can be released through flash flooding and bottom fish feeding. Amerindian communities consume indigenous fish 3-4 times a
week. Acute mercury poisoning of Guyana’s population will continue unless the government takes drastic action.

Despite the risks, studies show that about 63 per cent of miners contend that mining operations have no environmental impact (Richards 2000b). Small-scale miners are more concerned with their immediate survival and maximizing their income rather than long-term health risks on themselves and the hazards they pose to the environment.

Mercury contamination is not the only problem with small-scale mining. The EPA admits there have been ‘negative environmental and mining practices by small-scale miners’ and notes the ‘main problem is tailing from operations which cause increased sedimentation in [creek and river] water and discourses it’ (Rose 2001). Additionally, gold mining operations have left pools of stagnant water that increase the likelihood of malaria.

In the early 1990s, dredge mining was shifted from river to land, as rivers were perceived to have been depleted of gold. Alongside this shift is proof of careless mining and ecological devastation. Miners roam Guyana’s interior virtually uncontrolled and leave behind thousands of sterile acres, decapitated hills, scarred slopes and spoiled banks that are hostile to re-vegetation. The government suggests that the use of retort and other techniques can improve gold recovery with lesser impact on the environment. A retort is a closed container, which traps and cools mercury vapor when gold is burned. The liquid mercury can then be recovered and reused. No doubt this new technique would improve the situation, but to develop it would require a capacity that has so far proven beyond the Guyanese environmental regulatory bodies.

The prominence of Brazilians in the gold mining industry (there are about 5000 Brazilians in Guyana) has been of particular concern to the Guyanese government. Matt Fallon argues ‘the unorthodox methods and habits of the Brazilian miners are key in burgeoning phenomenon that is changing the face of the gold industry and the Guyana hinterland way of life’ (Richards 2001). The borders between Guyana, Brazil and Venezuela are notoriously porous. This poses a serious challenge to the Guyanese government’s ability to police the interior environment effectively and control plundering and pillaging. It is clear, however, that rapacious mining practices cannot be blamed on Brazilians alone. Guyanese small and medium size miners, including pork-knockers, employ mining practices similar to that used by the Brazilians.

Large-scale gold mining and cyanide contamination

Given the problems associated with small and medium size gold mining operations, Guyanese development planners have argued that large-scale mining projects are more manageable and less troublesome. The locus of this argument has been that the economies of scale would allow large-scale gold mining to be subjected to more strident regulations and therefore be more easily monitored and supervised (Colchester 1997, 74). This view has proven appealing to government officials. The EPA Operations Manager Denise Fraser notes that ‘larger companies … have been taking more care because in addition to being regularly monitored they have to work with an environment management plan which had to be approved before a
permit was granted’ (Rose 2001). Notwithstanding the Omai mine disaster, the Guyanese government claims that large-scale gold mining companies are ecologically sensitive and have been involved in less environmental pillaging than smaller operations. Many impartial, competent studies, however, indicate that large-scale gold mining operations present environmental problems of their own.

Prior to the 1970s, hydraulic and dredging methods were used to extract gold. Relatively recently, Canada introduced an inexpensive ‘heap leaching’ method. Heap leaching involves huge amounts of ore soaking with cyanide solution in an open pit that can stand up to 200 feet high and span over several hundred yards and is supported by dams lined with plastic and clay. This process has spread to almost every corner of the globe. It has helped mining companies boost production and lower costs and has become the preferred method of extracting gold by large-scale miners. The United States has over 265 heap leaching facilities (Albersworth et. al 1992). However, heap leaching is fraught with problems. The dams can leak, overflow, or rupture, and spill cyanide into the surrounding environment. The danger is even greater after a heavy rainfall. Liners can also wear down from the pressure and movement of ore and eventually rip, especially if they are carelessly installed and poorly inspected. Even under the best circumstances, controlling cyanide heap leaching is a challenge. Considering the problems with heap leaching in the United States, it is disturbing to know that Guyana, one of the poorest countries in the Western Hemisphere, encourages foreign companies to engage in such a dangerous enterprise without sound environmental standards.

The first serious contamination of the environment as a result of gold mining occurred in the Essequibo River in 1995, when cyanide sludge from a tailing pond of the Omai Gold Mine ruptured. About 838 million gallons of cyanide waste gushed into the Essequibo River and more than 15,000 Guyanese were at direct risk. Nearly all interior community water systems depend on river and ground water for domestic use. Several acres of forests, agricultural land, in addition to waterways, were severely polluted. The waste discolored nearby streams and rivers. Villagers reported seeing dead fish and animals floating belly-up in rivers. Children hundreds of miles away complained of sores, diarrhea, and rashes. International investigations revealed a history of administrative environmental neglect and bungling by Omai, most of it concealed with bureaucratic obfuscation. Before the August spill there were two earlier spills, which Omai downplayed as not serious. The Guyanese government declared the Essequibo River region an environmental disaster zone, but it was anxious to have Omai resume operation under ostensibly safer conditions because gold production has contributed significantly to the country’s GNP. Omai resumed operation six months later after a Commission of Enquiry ruled the spill an industrial accident. Affected individuals were minimally compensated (Roopnarine 2000).

Cyanide contamination at Omai was initially at 25 to 30 ppm, and then went down to 3 ppm. ‘[Cyanide] levels of two parts per million are potentially lethal to humans, a concentration as low as 0.5 ppm can kill some species, with 0.005 ppm having debilitating effects on fish’ (Baksh 1996, 29). Omai had promised to release cyanide concentration into the environment at 0.2, which is the maximum allowed by the World Health Organization and is the Canadian government drinking water standard (Jodah 1995, 2). One critic says that toxicity levels at Omai exceeded US
safety standards by 17 times. Five years after the Omai cyanide spill the *Stabroek News* reported that Walnot Chan gold mining operations spilled cyanide in the Wenamu River. Although Chan has denied using cyanide, an investigation by the Guyana Defense Force (GDF) discovered he was ‘using sodium cyanide to leach gold from the surrounding matrix’ (*Stabroek News*, 19 February 2000). The Guiana Shield Media Project (GSMP), an environmental organization that focuses on the Guianas, states water and soil samples taken by the GDF from the Wenamu River reveal cyanide concentrations to be about 0.6 ppm, three times the maximum safe amount cited by the World Health Organization. The government of Guyana responded to the Wenamu spill with a conciliatory note, claiming that only Omai is allowed to use cyanide, and even if miners want to use cyanide they have to have permission from GGMC. Miners, however, generally circumvent these regulations and import cyanide from neighboring Venezuela to carry out gold mining operations. The illegal importation and the use of cyanide in far flung areas such as Wenamu is possible because these places are visited less frequently by monitoring bodies, and therefore regulations are not enforced. The Guyana-Venezuela border regions are being infiltrated with dangerous concentrations of cyanide for which no regulatory control exists.

Equally alarming is the discoloration of the Essequibo and Konawaruk Rivers. These rivers turned red because of solid load, high rainfall, and high levels of iron. Water samples taken from the Essequibo and Konawaruk Rivers showed iron levels at 0.434 mg/l and 4.101 mg/l respectively. While no people were seriously hurt, the discoloration severely affected the way of life of surrounding communities. Residents did not use the river water, and many did not even want to wet their feet. According to Janette Forte, Amerindian communities ‘located within mining districts have suffered the worst direct impacts – environmental degradation, social disruptions, the inflationary effects of mining as well as demographic change as outsiders have come to outnumber the local inhabitants’ (Forte 1998, 91). The Amerindian People Association (APA) observes that the massive increase of mining activities in the interior have been coterminous with the rise of serious problems of cyanide and mercury pollution (*Stabroek News*, 9 February 2001). The *New Scientist* reports that ‘people [Amerindians] who live along the rivers are also afraid that many species of fish, their main source of protein, will be unable to spawn as their breeding grounds are wrecked or buried under the sands created by the new dredges’ (*New Scientist* 17 November 1990).

Big mining poses other problems for Guyana. Researchers warn that HIV has reached remote Amerindian communities as a result of gold mining (*New Scientist*, July 2000). Guyana law states no Amerindian under 14 should be employed in mines, work more than 8 hours a day, and all should be protected against explosives and poisonous substances (Mining Act, 1997), but mining companies do not observe these regulations on a consistent basis.

**Concluding remarks**

Although gold prices in the world market have dropped from US$440 an ounce to US$260 an ounce, there is no guarantee that the extensive ecological ruin caused by gold mining in Guyana will also decline. Development planners continue to
encourage the exploration of Guyana’s mammoth gold reserves, even if this means the lowering of regulatory standards. The government of Guyana is aware of the problems in the gold mining sector, and has implemented a series of environmental regulations to curb predatory gold mining. Effective monitoring of the gold mining industry has, however, proved to be beyond the capacity of the government. Administrative weaknesses, loopholes, corruption, and a lack of resources have seriously constrained the government from effectively monitoring and supervising mining activities. Untrained, underpaid, and under-funded staffs are susceptible to bribes and corruption. Legal loopholes contribute to the inability of regulatory bodies to minimize environmental damage and ensure the sustainability of gold reserves. It is expected that gold mining will continue, since Guyana relies on gold for badly needed foreign exchange.

Mining management agencies are overdue for reforms. Conscientious mining management requires a carefully crafted set of government-monitored incentives and sanctions rather than addressing environmental abuses on an ad hoc basis. Apart from applying state of the art technology and continuous environmental testing, the government should impose restoration laws, which require reckless miners to restore mined lands to their original contour. Restoration violators are easier to detect with fewer financial burdens. The government can deny mine operators permits if applicants fail to guarantee protection against environmental damage. Additionally, miners should be required to place performance bonds equal to the cost of land reclamation if the government has to undertake such an endeavor.

Mining management systems can be envisioned as a chain of ecological and economic links. If any one link of the chain is weak, the entire system will fail. Rather than over-regulating the gold mining industry, the government ought to study and explore new opportunities that would encourage miners to play a more productive role in the sound management of Guyana’s vital gold reserves.

* * *

Lomarsh Roopnarine is Assistant Professor of History at the University of the Virgin Islands, St Croix Campus. His research interests relate to environmental policy challenges and development in Guyana and the Caribbean, and Indo-Caribbean indenture, resistance and accommodation. <lroopna@uvi.edu>

Bibliography


