

Blacksmith Institute

Annual Report 2007

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Blacksmith Institute

Blacksmith Institute's vision is a clean planet for our children. We develop and implement solutions for pollution-related problems in the developing world.

We work cooperatively with partnerships of donors, governments, NGOs and others to provide strategic, technical, and financial support to local champions striving to solve pollution-related problems in their communities.

Since 1999, Blacksmith Institute has been addressing a critical global need: the clean-up of dangerous and largely unknown polluted sites throughout the developing world. Industrial wastes, air emissions, and legacy pollution from old industry affect millions of people. Women and children are especially at risk. Tens of thousands of people are poisoned and killed each year. Others have developed neurological impairments, damaged immune systems, and long-term health problems. The World Health Organization, in conjunction with the World Bank, estimates that 20 percent of deaths in the developing world are directly attributed to environmental pollution. This threatens efforts to create sustainable economies, protect local environments, and improve the health and development prospects of people living in poverty.

Blacksmith's priority is to work in locations throughout the developing world where human health is most affected by pollution. Our programs involve a multi-step process of:

- Identifying polluted places, with nominations received from members of the international community and through the internet,
- Assessing the health risks at those locations by reviewing nominations with a Technical Advisory Board of leading international specialists on a rolling monthly basis,
- Visiting candidate sites with likely high health risk implications,
- Conducting an Initial Site Assessment, a triage protocol that validates likely health implications, and enables the design of an intervention, and
- Designing and implementing a remediation strategy tailored to the specifics of the site in question, using local people to implement the project in a cooperative fashion.

Our work encourages the international community to recognize local point-source pollution as a pressing issue of grave concern.

Through our continuing support of local initiatives, Blacksmith enables practical responses to pollution within communities. This approach capitalizes on local knowledge and networks and is inclusive of all site stakeholders from community leaders and local governments, to industry, national and international actors .

Blacksmith Institute's name is inspired by the hard work of a blacksmith who, in a dirty environment, creates items that are practical, useful, and can stand the test of time. Blacksmith Institute strives to emulate this with its projects - creating and supporting local agencies to solve pollution problems.

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World's Worst Polluted Places 2007

Blacksmith Institute Launches Second Polluted Places List

Blacksmith Institute released its second annual report 'The World's Worst Polluted Places' on September 12, 2007 in partnership with Green Cross Switzerland. Two joint press conferences were held to reveal this year's Top Ten and Dirty Thirty lists of polluted places. The report was picked up and distributed by over 40 international media outlets including the BBC, Reuters, the Financial Times, National Geographic, Time Magazine, Forbes, Le Monde, Le Temps, and Swissinfo. Local media outlets with distribution close to the sites featured in the report such as Kommersant, the Zambia Daily Mail, the Hindustan Times, and the Philippine Daily Inquirer have generated intense pressure on polluters and policymakers in these highly toxic areas.



Abandoned mentally handicapped children in a Chernobyl area orphanage. (photo credit: Alex Emes)

The Goal: To give voice and urgency to the "Brown Agenda" (i.e., the issue of long-term pollution), which competes with the "Green Agenda" (conservation, biodiversity) and Global Warming for attention among journalists and policy-makers concerned with the environment.

Nominations: Blacksmith staff members identified and researched 35 sites culled from more than 500 that had been presented to Blacksmith over the past eight years for support. Nominations are submitted by members of local communities, non-government organizations (NGOs) and a broad range of environmental authorities around the world.

Evaluation: Using a scoring criteria specifically developed for this purpose, Blacksmith's TAB weighed pollution conditions in terms of their impact on human health, the size of the affected population, and specifically the risk to children's development.

(alphabetical by country)

Sumgayit, Azerbaijan
Linfen, China
Tianying, China
Sukinda, India
Vapi, India

La Oroya, Peru
Dzerzhinsk, Russia
Norilsk, Russia
Chernobyl, Ukraine
Kabwe, Zambia

As a result of the media attention:

- The General Manager of Doe Run Peru, the US-based owner of the actively polluting metallurgical facility in La Oroya, Peru, has invited Blacksmith Institute to visit the city of La Oroya and surrounding communities.
- Norilsk Nickel in Russia, responsible for producing a fifth of the world's nickel and emitting tons of highly polluting compounds, has contacted Blacksmith Institute to partner on a remediation project in order to tackle the legacy pollution issues.
- The report has also received some negative feedback. In Sumgayit, Azerbaijan, local and national officials as well as community members have protested the listing of their city in the Top Ten. They have invited Blacksmith Institute to visit the area to better understand the local situation.
- A similar response has come from Vapi, India, where the industry association rejected our report. Also in India, companies from Sukinda have reported better conditions than we mention. Blacksmith continues to monitor these places and will provide updates with the release of our next list.



Global Pollution Remediation Fund



THE GPRF WILL BE DIRECTED TOWARD CLEANING UP OVER **400** HIGHLY POLLUTED LOCATIONS WORLD-
WIDE THAT AFFECT MORE THAN **100** MILLION PEOPLE.



ABOUT THE FUND

The Global Pollution Remediation Fund (GPRF) was launched in principle in October 2007 by representatives from governmental agencies of the United States, Germany, China, Russia, Mozambique, Kenya, and the Philippines. Also part of the launch were representatives from the World Bank, the United Nations Industrial Development Organization, Green Cross Switzerland, Blacksmith Institute, as well as leading researchers from within the public health and pollution remediation fields. GPRF, a planned \$400 million fund, will be dedicated to combating toxic pollution in developing countries that has resulted from industrial, mining, and military operations.

The Fund will be directed toward cleaning up over 400 highly polluted locations worldwide that affect more than 100 million people - people who suffer from reduced life expectancies, increased cancer risks and severe neurological damage. Projects initiated by GPRF will efficiently channel funds to local stakeholders with technical support and oversight provided by a central Secretariat. Conference organizers are currently approaching donors in various country development agencies, multilateral development banks, and other international aid organizations along with high net-worth individuals to develop funding.

Project Highlights: Africa

Blacksmith Country Representatives

Delax Chilumbu
Zambia
Advocacy for Restoration
of the Environment

Amadou Diouf
Senegal
Director, Africa Clean

Saada Juma
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Artisanal Gold Mining in Senegal

Small-scale or artisanal gold mining is one of the largest sources of mercury emissions into the atmosphere world wide. In an ongoing effort to mitigate global contamination and protect the health of artisanal mining communities, Blacksmith Institute partnered with the Global Mercury Project to implement a series of appropriate technology trainings in the eastern region of Senegal. Specifically, Blacksmith works with miners to develop local adaptations of a retort - a tool developed by the Global Mercury Project - to capture the mercury for reuse. The use of local materials has showed that the miners are quick to adapt the technology as they can understand, make and repair the retorts - which by capturing the mercury also provide an economic incentive. By enabling artisanal miners to use mercury safely, they can retain their livelihood while protecting their health.



Initial Site Assessments - Kenya

In a partnership with Kenya's National Environment Management Authority, Blacksmith has undertaken several site assessments to reveal some of Kenya's worst environmental hotspots. Along with expanding the inventory, future projects with NEMA will include: remediating soils contaminated with hexavalent chromium, a known carcinogen, near Nairobi; containing PCB oils spilt along the Ngong and Athi Rivers flood plain; developing national policies to end informal lead battery recycling as well as cleaning up legacy sites; and expanding our appropriate technologies training program with artisanal gold miners in Kakamega, Western Kenya.



Project Highlights: India

Pioneering Hexavalent Chromium Remediation in India - Uttar Pradesh

Kanpur is the largest and most industrialized city in the Indian State of Uttar Pradesh. It is home to more than 300 tanneries; many of which discharge untreated effluent into the River Ganges. That effluent often contains a toxic sludge of hexavalent chromium (Cr VI), arsenic, cadmium, zinc, mercury, nickel or cobalt.

One former tannery was the cause of a plume of Hexavalent chromium under the community of Noraiakheda, contaminating the groundwater of more than 30,000 residents. While Hexavalent chromium is a severe carcinogen, it can be converted to its relatively innocuous trivalent state with a simple procedure. That procedure, used in India for its first time here, involves injecting an electron donor into the plume. To do this several wells were drilled, one for the injection of the electron donor, and several more for monitoring. The procedure is illustrated in the chart below.

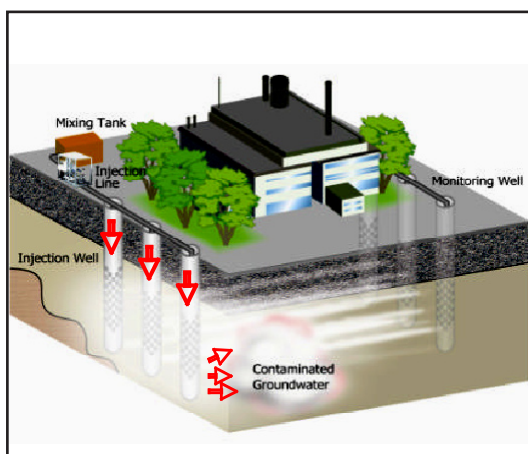


Diagram of the bioremediation process at Kanpur

"Vermiculture" - Worms Cleaning up Toxins

Muthia village lies on the eastern periphery of Ahmedabad City. Approximately 60,000 tons of sludge from effluent treatment plants were dumped here over the last decade. These hazardous wastes have leached into the groundwater, turning it yellow and red. Monsoon rains wash and spread the contaminated sludge over wide areas.

In partnership with local authorities and NGOs, Blacksmith funded the implementation of a three phase clean-up, the last phase of which is the treatment of the site with vermiculture – using worms – which concentrate heavy metals in their bodies, and reduce contamination in the soil.

This indigenous low-cost method has proved highly effective in managing & treating waste dumps elsewhere. The plot is only one of several "high impact" dumps in the same area and these others also need to be tackled. The exercise was documented by CNN International and aired across the globe in October 2007. (www.cnn.com/ecosolutions)

Blacksmith India Partners

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India Coordinator

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Center for Environment
Education

Samit Kumar Carr
Occupational Safety &
Health Association of
Jharkland

Dr. Suneet Dabke
Concept Biotech

B.K. Gupta
ALERT Sansthan

Dr. Ashwani Kumar
Industrial Toxicology Re-
search Centre (ITRC)

Rakesh K. Jaiswal
Eco-Friends

Legacy Lindane Contamination - Uttar Pradesh

There are two plants in India that produce Lindane. One of these is in an industrial estate at Chihat outside Lucknow. Lindane production results in large quantities of toxic waste by-products and for years before strict regulation was put in place, Lindane was regularly dumped in surrounding areas.

Lindane is a pesticide that has been progressively eliminated from many applications since the mid- 1970s in Europe and the US, but is still used in the rest of the world. It is absorbed through respiratory, digestive or cutaneous routes and accumulates in fat tissues; damaging the liver and kidney, and neural and immune systems. It induces birth defects, cancer and even death.

The Industrial Toxicology Research Center (ITRC) in Lucknow is being supported by Blacksmith to conduct a bioremediation trial in one contaminated site near Chihat, with the agreement of the Lindane manufacturer and the landowner. The bioremediation approach will scale up of successful laboratory work on the same type of wastes. The complete exercise is expected to be completed over two years; however the investigation phase is being covered in its first year of execution.



Hexavalent Chromium burns in Ranipet, India

Project Highlights: Eastern Europe

Blacksmith Country Representatives

Vladimir Kuznetsov
Russia
Polluted Places Coordinator

Petr Sharov
Russia
Far Eastern Health Fund

Alexey Yablokov
Russia
Director, Center for
Russian Environmental
Policy in Moscow

Ufa: "Dioxin Capital of the World"

The large extent of pollution caused by fertilizer plants here has led to Ufa being called the "Dioxin Capital of the World." Dioxin, made famous when it was used to poison Ukrainian President Viktor Yushchenko, is a carcinogen and also a poison. Because of the scale, Blacksmith set out in 2007 to organize a Stakeholder Group to develop an appropriate plan. So far the group has managed to prepare a plan to remediate much of the area. Moreover they have worked with the local authorities to halt active contamination.



Rudnaya Pristan: Lead Pollution

In the Russian Far East on the Sea of Japan, the town of Rudnaya Pristan has some of the world's worst lead pollution. An old smelter here has contaminated much of the town and its surroundings. A recent study suggests that drinking water, interior dust, and garden crops contained dangerous levels of lead.

Blacksmith's current program here is threefold: focusing on monitoring blood levels in children; outreach and education; and finally remediation. In 2007 we tested more than 400 children and 100 pregnant women; a full one third of whom showed elevated levels.

In September, Blacksmith and project partners remediated a Kindergarten playground. In all, 4400 sq. meters were cleaned, and 1100 cu. meters of contaminated soil were removed.

To limit exposure before the remediation, Blacksmith conducted community outreach. As part of this, we met with families of children that had blood lead concentrations over 8 ug./dl. On each meeting we provided specific recommendations to each family on ways to reduce the risk of lead poisoning. In addition to consulting individual families, we conducted general educational activities. In local schools and kindergartens the project team held lectures for parents on lead health risk.

Penza: Chemical Weapons

In the early 1950's several tons of chemical weapons were illegally dumped in the forest near several villages in the Penza region. As a result the grounds were heavily contaminated with components of chemical weapons, penetrating area water. Specialists from Penza State University and the Penza branch of Green Cross developed specific measures for rehabilitating this area. They were able to apply these to 3 sites last year.

Project Highlights: East Asia and Latin America

Philippines: Marilao-Meycauayan-Obando River System

The Marilao, Obando and Meycauayan River system in the Philippines hosts a multitude of industrial activities along its shores, including: lead recycling facilities, gold refineries, tanneries, open dumpsites, and electroplating. Many of these industries do not have waste treatment facilities and the effluents pollute the surface water system, directly affecting 250,000 people and a thriving aquaculture economy.

Since 2005, Blacksmith Institute has supported a local Stakeholder Group comprised of community leaders, local government representatives, scientists and industry representatives who have worked to stop ongoing pollution and treat legacy wastes.

In 2007, we continued our work identifying industry partners and areas for bioremediation.



Blacksmith Country Representatives

Marlo Mendoza
Philippines
Coordinator

Leyan Wang
China Projects
Coordinator

Pak Sokharavuth
Cambodia
Ministry of Environment

Liu Zhoade
China
Oriental Environmental
Institute

Dominican Republic: Lead Contamination

Bajos de Haina is a Dominican community near a former automobile battery recycling smelter. According to the United Nations, the population of Haina is considered to have the highest level of lead contamination in the world. Blacksmith has been working closely with the Dominican Secretary of Environment and Natural Resources, to implement a remediation project to remove the lead-bearing residues from the town. Currently members of the Haina Stakeholder Group are conducting a community wide education and testing campaign. Moreover, partial remediation funds have been committed by the Dominican Government and the factory owner for full remediation.



Current Project List

CHINA

Huaning City, Yunnan Province
Heavy Metals in Drinking Water

Nanhua Chemical Factory, Yunnan Province
Legacy Arsenic Contamination

DOMINICAN REPUBLIC

Haina
Legacy Battery Recycling

GUINEA

Conakry
Centre d'Appui au Développement
PCB Cleanup and Removal

INDIA

Amlakhadi River, Gujarat
Society for Environment Protection
Industrial Effluent

Bichhri Village, Rajasthan
ALERT
Dyes in Drinking Water

Chinhat, Uttar Pradesh
Centre for Environment Education
Lindane

Muthia Village, Gujarat
Concept Biotech
Hexavalent Chromium

Noraiakheda, Kanpur
Ecofriends
Hexavalent Chromium

Panki Katra, Kanpur
Ecofriends
Fly Ash

Roro Hills, Jharkhand
Occupational Safety & Health Association of
Jharkhand
Legacy Asbestos Mines

Tiljala, Picnic Gardens, Kolkata
GreenC
Water Treatment Feasibility Study

KENYA

NEMA
Tannery Effluent

KYRGYZSTAN

Bishkek
Toxic Action Network Central Asia
Pesticides

MOZAMBIQUE

Manica
Ministry for the Coordination of Environmental
Affairs (MICOA)
Artisinal Gold Mining

PERU

La Oroya
Legacy Lead Mine

PHILIPPINES

Clark and Subic Air and Naval Bases
Organochlorine Pesticides and PCBs

Marilao River Basin
Industrial Effluent

RUSSIA

Krasnoufimsk
Ural Ecological Union
Legacy Radioactive Monazites

North Sakhalin
Sakhalon Environment Watch
Petroleum

Penza
Green Cross Russia
Penza Brunch
Chemical Weapons Legacy

Rudnaya Pristan
Far Eastern Health Fund
Lead

Ufa
The Union of Ecologists of Republic
Bashkortostan
Dioxins

SENEGAL

Dakar
AfricaClean
Air Pollution

Le Baie de Hann
Heavy Metals

Tambacounda
Artisinal Gold Mining (Mercury)

Leaded Gasoline Vendor Testing

TANZANIA

Mikocheni, Dar es Salaam

Dar es Salaam
Leaded Gasoline Vendor Testing

ZAMBIA

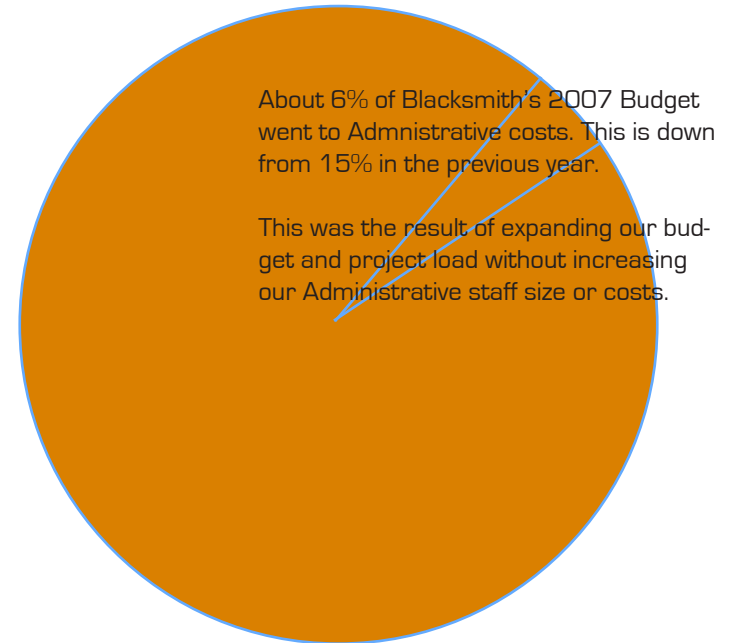
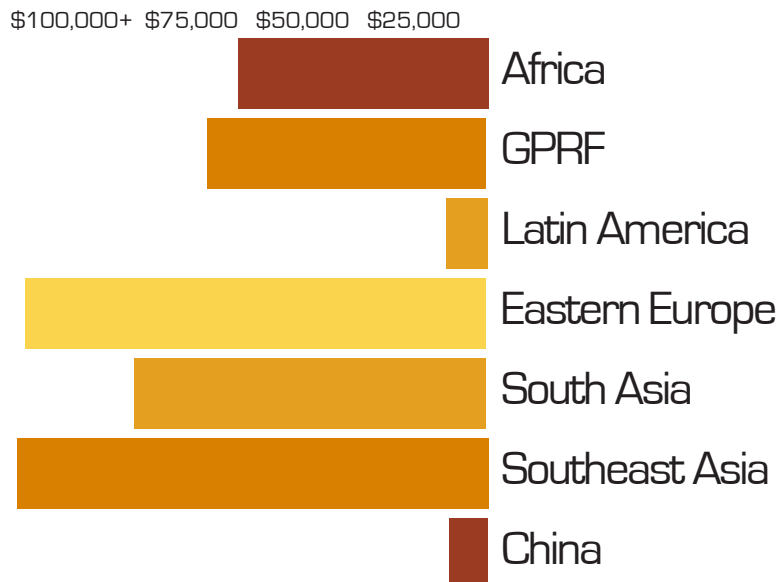
Kabwe Clean-up Oversight
ARE (Advocacy for Restoration of the
Environment)

2007 Financial Highlights

In 2007, Blacksmith Institute's total revenue was approximately \$1.3 million, up 35% from our 2006 budget of \$870,000. This increase was the result of focused fund raising efforts and strategic development planning. Blacksmith's 2007 expenditures totaled over \$900,000, with commitments of further expenditures \$400,000 in 2008. Of that figure, 94 percent or nearly \$850,000 went directly to our programs.

This past year, Blacksmith Institute supported 30 ongoing projects in 14 countries, completing 7 in 2007 and renewing 24 for 2008. More than sites have been nominated to our Polluted Places online database and Blacksmith Institute continues to approve new projects. We are constantly expanding geographically and are tackling a diverse range of environmental and human health issues.

Private institutions and foundations continue to be the major funding sources for Blacksmith, though individual donations provide substantial support for our programs.



An important part of our strategy is our ability to leverage funds from multi-lateral donors and governments to turn small pilot interventions into large-scale remediations.

The scale of many project sites often exceeds our entire operating budget. These leveraged funds therefore cover much of the remediation.

For instance, in Zambia, the full remediation of the Kabwe lead mines was covered as part of a larger \$40 Million World Bank loan to the region. In

Kanpur, India, solving a hexavalent chromium problem in one village leveraged \$100 Million to remediate similar sites throughout the country.

Kanpur	Kabwe
\$30,000 Investment by Blacksmith	Less than \$100,000 Investment by Blacksmith
\$100 Million Loan from the World Bank	\$40 Million Loan from the World Bank

2007 Donors

Blacksmith Institute would like to thank the following individuals and organizations for their generous support:

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