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Solving Pollution Problems.  
Saving Lives

## Project Summary Report

### **Polluted Places India (Supported by ADB under PEP)**

India

January 2005 to December 2007

Cost – Blacksmith:     \$ 155,000  
          ADB:               \$ 250,000

- **Project Summary:**

In India industrial pollution significantly impacts the health of the poorest communities, especially women and children. Water resources such as streams, rivers and groundwater supplies provide drinking water for most of the rural poor and its pollution results in severely impeded opportunities for socio-economic development for millions of people. Polluted industries are invariably located in the community's poorest areas, thus evading scrutiny from regulators and unofficial monitors. Surrounding areas usually house illiterate people who are oblivious to the dangers of industrial pollution and who lack representation on health and political issues.

In 2005 Blacksmith Institute was awarded a grant under the Asian Development Bank's **Poverty and Environment Program** to initiate a project to reduce mortality and morbidity levels caused by chemical pollution in local communities, as well as strengthen local government and community capacity to undertake successful remediation efforts in India. The main objectives of this project were to identify sites where communities have been severely impacted by industrial pollution, conduct initial site assessments in at least 12 of the sites, initiate interventions in at least five sites and conduct pilot-scale remediation at two sites.

The project has been undertaken consistent with ADB's overall goal of ensuring environmental sustainability through the urban social infrastructure and environmental projects detailed in ADB's *Country Strategy and Program Update 2005-2007 for India*.

The initial stages of this project were carried out at a time when considerable attention was being focused on the broad problems of toxic waste in India and

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the need for remediation. The Government of India, through the Ministry of Environment and Forests (MOEF) and the Central Pollution Control Board (CPCB), was examining the scope of the problem across the country and considering the extent of a national remediation program. In this context, ADB and Blacksmith agreed that site assessments and relevant findings emerging from this project would be shared with MOEF/CPCB, in order to support the process of priority setting and planning for large-scale remediation.

Data from the research, and results from pilot interventions were shared openly, and provided the platform for an investment of approximately \$90 million in clean-up funds from the World Bank for the most problematic sites. A substantial component of these resources are IDA funds. In further support of this project, in June 2008 Blacksmith hosted a delegation from MOEF and CPCB in New York City, and members of the TAB arranged for site visits to various remediation locations in the region.

### **Activities:**

Blacksmith's approach to dealing with heavily polluted sites is based on a structured program that narrows a broad numbers of site nominations to a carefully targeted set of practical interventions. There are four basic steps:

#### *Site Nomination and Review*

The project began with a call for nomination of critically polluted sites in India, from all sectors of the community. Nominated sites were first reviewed and researched by Blacksmith Institute's head office staff. The Blacksmith Technical Advisory Board (TAB) further reviewed the most problematic sites against two key criteria: is there likely to be substantial health impact due to the pollution; and could Polluted Places resources could make a difference.

Nominations were received for around **130 sites** in India out of which, **74** were reviewed by the TAB.

#### *Initial Site Assessments (ISA)*

The Initial Site Assessment (ISA) involves a visit to the site, reviewing local information, taking samples and tests, and meeting with all key stakeholders. The protocol was developed for Blacksmith the John Hopkins School of Public Health.

The project design envisaged that 12 to 15 sites would be investigated. In practice, a total of **34 Initial Site Assessments** were conducted as part of this project. Full reports were completed on all 34.

#### *Intervention Design and Implementation*

The project then looked to initiate work to clean-up problem sites identified in the Initial Site Assessment.

Of the 34 sites visited, about one third are either active sites where the priority is to control the on-going discharges or sites where the problems are already under the control of the relevant authorities. In these cases additional intervention

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under this project was not considered to bring appreciable additional benefits.

Some additional sites did not show a clear linkage between the pollution and recognized health problems. No further action was proposed at these sites. A few other sites were unclear as to whether health had been impacted, and the recommendation from the project was for local studies to determine such a link.

The remainder of the sites (about 10 in total) resulted in interventions under the project scope, either in the formation multi-stakeholder groups, or in pilot remediation projects.

#### *Remediation Pilots*

Four site-specific pilot projects were selected for early implementation under the project as a demonstration of how remediation efforts could be started, even with relatively limited resources, and a fifth was initiated as a generic approach for treatment of contaminated groundwater to allow its use for non-potable purposes.

The pilot projects undertaken were:

#### Kanpur Groundwater Contaminated with Hexavalent Chromium (UP)



- Coordinated with Indian Institute of Technology, Central Pollution Control Board, the Industrial Toxicology Research Centre, and the national Geophysical Research Institute.
- Bioremediation of Chromium VI plume in groundwater, the first such project in India.
- Injection of electron donor material into the groundwater, with monitoring wells down-gradient

- Proven conversion of 99 percent of Chromium to the lesser toxic and immobile Chromium III

#### Muthia Hazardous Waste Dumps (Gujarat)

- 2,750 tons of contaminated soil removed to safe disposal
- Treatment of remaining soil with vermiculture (worms)
- Proven success of treatment has lead to second phase of treatment being undertaken outside of the project scope.



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Chinhat Soil Decontamination from Lindane Pesticide (UP)

- Partnered with the Industrial Toxicology Research Center in Lucknow
- Development of bioremediation technique to break down HCH (pesticide)
- 100,000 people affected

Panki Land Rehabilitation (UP)

- Fly ash remediation trial using mycorrhizal inoculation - fungi
- Reduction in heavy metal levels proven

Lead Contamination in Battery Recyclers, Picnic Gardens (WB)

- Partnered with WBPCB
- Review of lead contamination conducted – very heavy soil levels reported
- Remediation planning on hold

The interventions that are developed from the ISAs therefore comprised both support for the process of finding solutions as well as the design and financing of pilot remediation activities.

*Stakeholder Groups*

Blacksmith's approach relies heavily on building local consensus around the seriousness of a given problem, and developing a common commitment to putting into place appropriate practical remedies. This is done through cooperative stakeholder groups, led by Blacksmith.

In places with pilot programs, and in other project locations, stakeholder groups were established with support from the project, and many are ongoing. Each group involves representatives of government, industry, the NGO community, and other institutes, meet on a regular basis, and move forward the work of initiating remedial activities related to pollution. Stakeholder groups were initiated in Kanpur, Bicchadi, Gujarat, Chinhat, Picnic Gardens, and Roro Hills.



*Stakeholders consultation Meeting on Lindane at Lucknow*

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### **Lessons Learned:**

The project shows the value that can be seen in the **cooperative model of dealing with the contamination**. This model concentrates on the **remediation rather than recrimination** – while expecting those responsible to contribute to the cleanup and encouraging the regulatory authorities to put pressure on offenders to take action. Related to this approach is the value and effectiveness of concentrating on the 3 Ps - *pathway* and on the *people* who are affected by *pollution*.

One pleasing outcome of the interventions is the way in which actually starting practical implementation can **catalyse a broader set of interventions**. Whether the problem is pesticides, water pollution to toxic dumps, the first step is often the most important. This overall project demonstrates the value of this approach, for the confidence and direction that it provide as well as for the practical results that the initial intervention can provide. The most significant of these is the World Bank investment, which will have a direct impact on human health.

Finally, the project highlighted implementation of **novel approaches to remediation**, not seen before in India. From in-situ remediation of Chromium VI to vermiculture and bio remediation, these techniques are low cost, and provide real world methods to deal with pollution in countries in transition.