

**Project Completion Report:
Kabwe Lead Smelter Clean-up**



Project Details:

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| Location | Kabwe, Zambia |
| Contaminant | Lead |
| Project Duration | 2000-2008 and ongoing |
| Project Cost | \$45,000, leveraged into a \$20 million loan from World Bank/NDF |
| Implementing Partners | Copperbelt Environment Project; World Bank; Kabwe Environmental and Rehabilitation Foundation |

Performance Metrics:

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| Toxin | Lead |
| Affected Population | 210,000 |
| Exposure Standards | 10 µg/dl in Blood is the acceptable WHO standard |
| Levels Prior to Project | 60-120 µg/dl in the tested population |
| Levels After the Project | Blood levels monitored and dropping |

- **Background and Scope:**

Kabwe, the second largest city in Zambia with a population of 300,000, is located about 130km north of the nation's capital, Lusaka. It is one of six towns situated around the "Copperbelt," which was once Zambia's thriving industrial base. In 1902, rich deposits of potentially dangerous lead were discovered in the mine and smelter located in the center of the town. Ore veins with lead concentrations as high as 20 percent have been mined deep into the earth and a smelting operation was set up to process the ore. Mining and smelting operations were running almost continuously up until 1994 without the government addressing the potential danger of lead. The mine and smelter, owned by the now privatized Zambia Consolidated Copper Mines, is no longer operating but has left a city with poison and toxicity from hazardous concentrations of lead in the soil and water.

While in operation, there were no pollution laws regulating emissions from the mine and smelter plant. In turn, air, soil, and vegetation were all subject to contamination, and ultimately, over some decades, millions of lives were also affected. Some recent findings reveal the extent to which lead has affected the health of Kabwe citizens. In the U.S normal blood levels of lead are less than 10 µg/dl (micrograms per deciliter). In Kabwe, blood concentrations of 300 µg/dl have been recorded in children and records show average blood levels of children were between 60 and 120 µg/dl.

- **Solution Implemented:**

Kabwe's decades of contamination required a complex clean-up strategy. Blacksmith has helped Kabwe's environment by establishing a local NGO, Kabwe Environmental and Rehabilitation Foundation (KERF), whose role is to bring educational and healthcare services into each community. At Blacksmith and KERF's urging, the World Bank provided a \$15 million grant for cleanup purposes, and subsequent \$5 million funding also arrived from the Nordic Development Fund. These results demonstrate that Blacksmith's initiatives can be leveraged to enable large contributions from major global institutions for remediation of serious pollution related problems.

With Blacksmith providing technical consultancy and resources pro bono, the government's Copperbelt Environment Project (CEP) has worked to determine the magnitude, sources, and pathways of human lead exposure, and to improve public awareness in order to end future contamination. In 2003 they began educational outreach to inform the public of behavioral and hygiene changes that would reduce their risk of lead exposure; at times these have proven to be as simple as preventing children from playing in the dirt and rinsing dust off plates before meals. CEP has also seen the critical importance of empowering locals with better access to clean water, which will free them from reliance on tainted sources. Some areas of Kabwe required drastic remediation, at times calling for entire neighborhoods to relocate.

The CEP is implementing a comprehensive program on risk communication and humanitarian development. Since its inception, the CEP has been implementing an intensive community outreach program aimed at raising awareness as well as providing simple messages on how to avoid lead exposure. This program also strengthens local community organizations and coordinates them with the government initiative. Working closely with the local authorities, 10 community development staff members have been

attached to the CEP, and its actions are based on a "community facilitator model," where community facilitators or volunteers from each effected area are closely involved in the project implementation.

The CEP has conducted clean-up of the highest threat level contaminated soils, including a contaminated canal, and a great number of toxic hotspots and neighborhoods throughout the town. More work is needed in this regard.

- **Project Performance:**

The Kabwe Lead Education Program is now being implemented in the schools, where the CEP is working closely with the Ministry of Education to reach the more than 20,000 children in the areas significantly polluted with lead. This program revolves around a localized curriculum about lead dangers and proper safety precautions. Another aspect of the program, the "Green-is-Clean Campaign," promotes planting grass in order to bind the topsoil together and reduce potential lead exposure through loose soil and dust.

A medical management program has also been developed and is being implemented to reduce the elevated blood lead levels in children. Presently this medical intervention targets children found with elevated blood lead during the citywide survey.

- **Outcomes and Follow Up:**

A total of 160 children with blood lead levels above 45 µg/dl are targeted for the household intervention program. Out of these, 38 children with levels above 70 µg/dl are already on the program and the CEP continues to scale up the number of children that it serves. In support of all these efforts, the CEP has also embarked on a Water Project to provide locals with safer water sources. The project is also developing playgrounds and parks in all impacted communities that, when completed, will be safe and lead-free play areas for children. Additionally, two Public Information Centers have been built and more are slated for construction. These centers will serve as educational and community outreach headquarters.

Blacksmith continues to provide oversight and watchdog capacity to the World Bank project.

