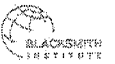


## About Blacksmith Institute

- Established 1999, HQ in New York City, operational in 17 countries, small HQ, distributed staff
- Implementing agency
- Pollution in low and middle-income countries
- Toxics – mostly heavy metals and carcinogens
- Legacy sites, artisanal industries
- Cooperative model focusing on implementation – not advocacy

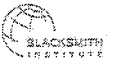
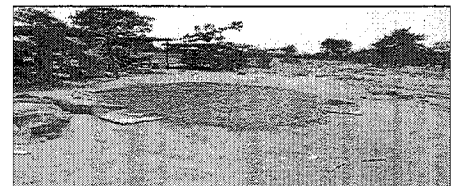
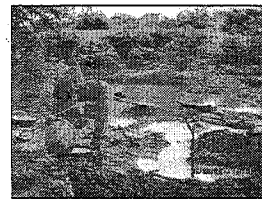


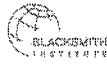
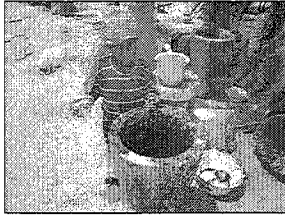
## Zamfara Lead Poisoning Epidemic

- 30% to 43% of all children under 5 years in some villages
- 45% of cases presented to clinics died
- Blood lead levels 150 - > 600 ug/dl
- Every child and adult tested lead poisoned
- Long-term irreversible health effects



Discovery of the problem  
Subsistence gold mining in  
lead-laden soils





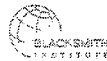
## Pathways of Exposure

- Kids playing on the ground
- Contaminated Food



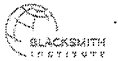
## Treatment Protocol

- Two Hospitals Built and Staffed (MSF)
- 2500 children estimated ~ 1000 in treatment to date
- Children must Return to Clean Environment
  - Relocation
  - Remediation (TerraGraphics/Blacksmith)



## International Coalition

- Federal and State Government
- MSF built Two Hospitals – Anka and Bukkuyum LGAs
- Seven Village Cleanups TerraGraphics/Blacksmith June-March
- CDC Assessment of other villages
- Dutch - UN OCHA Water Assessment Team
- WHO Statewide Assessment Health Services Support

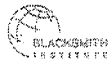


## Capacity Building through active Partnership

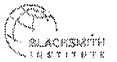
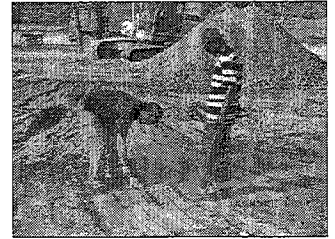
- 2500 Children require hospitalization
- 10 TG personnel – 14 Blacksmith volunteers
- 40 State Professional Staff
- 80 Local Government Personnel
- Male – Female Pairs
- 280 Village Workers



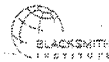
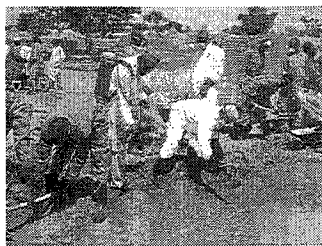
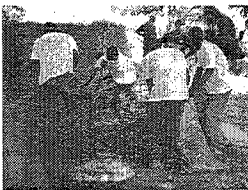
Dr. Ian von Lindern of Terragraphics, Environmental Engineering



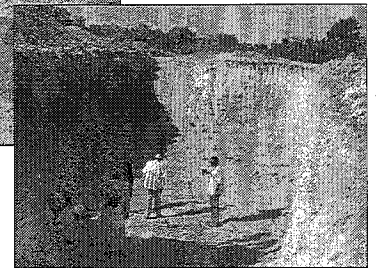
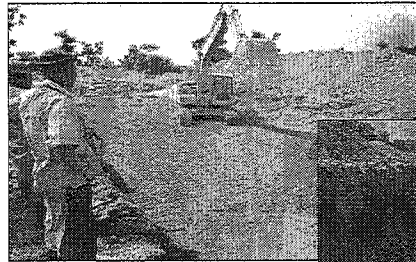
## Testing



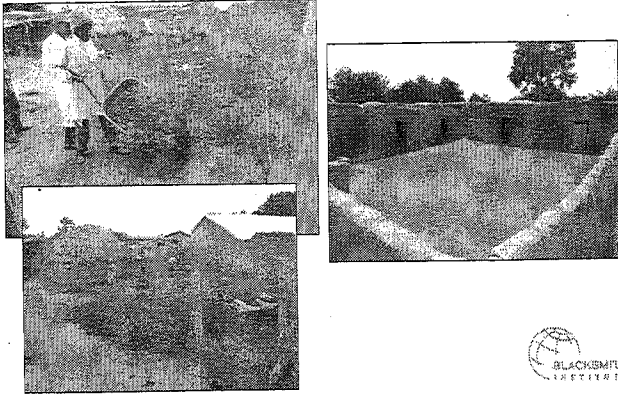
## Excavation



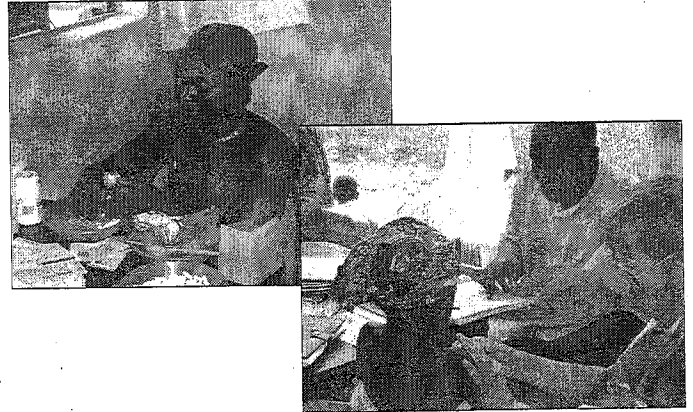
## Landfill Disposal



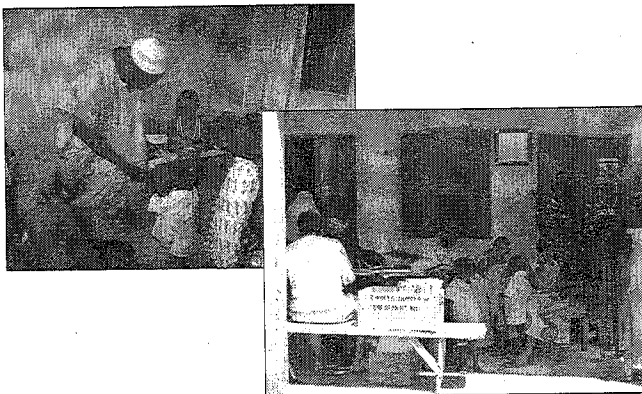
## Clean soil replacement



## Treatment of Kids



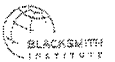
## Treatment of Kids



## Health Indicators

According to MSF data:

- More than 1000 children have been enrolled in the treatment program.
- Mortality rate decreased from 43% pre-intervention to < 1%.
- 469 children below 45 mcg/dl – on follow-up but not active treatment
- Only 11 children discharged so far (blood lead levels below 10 mcg/dl).



## Work is still needed

**BAGEGA Village, and other identified contaminated villages must be decontaminated as soon as possible**

• Children cannot receive treatment without assurance they are returning to clean environments.

• 1500 children are very sick and in critical need of treatment

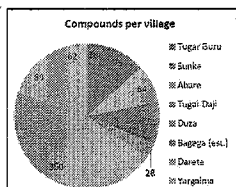


Figure 2. Number of compounds supporting remediation in the 7 villages and Bagega.

**TerraGraphics**  
Environmental Graphics, Inc. www.terragraphics.com

## Lessons Learned :: Critical Point 1

**Affected people have the power, when given accurate information, to make changes required**

Health education and communication are the most essential part of a sustainable intervention.

When people understand the consequences of unsafe mining for the health of their children, along with affordable solutions, they can take steps to protect themselves and their families.



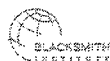
## Lessons Learned :: Critical Point 2

**No further remediation can be conducted until safe mining practices are developed and accepted by all.**

• Mining activities, milling and processing of ALL KINDS must be kept in specific, non residential areas outside of the villages

• Facilities and programs must be developed to ensure that people who engage in artisanal gold mining can safely mine and process ore.

Remediation activities CANNOT resume unless there is assurance that clean areas will not be recontaminated.



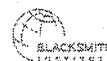
## Lessons Learned :: Critical Point 3

**Backed by the technical support from the international coalition, the Government must put education and financial mechanisms in place to resolve these issues:**

• Financing of safe mining development assistance

• Financing of remediation activities

• Financing of health interventions and treatment

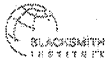


## Lessons Learned :: Critical Point 4

**The role of international agencies is limited – monitoring and regulatory support must come from within all levels of Government.**

- Decontamination of villages and treatment of children is useless if children keep being exposed to lead.

**Capacity has been built in the State and Local Government Authorities to continue remediation activities – Approx 120 government employees now have the technical ability needed, along with 280 village laborers.**



## Future Challenges - Bagega

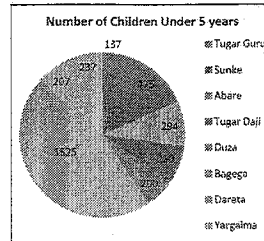


Figure 1. Number of children under 5 years of age in the 7 remediated villages and Bagega. Based on 2005 census data.



• Mining activities are ongoing in an unsafe manner

• 1500 children require immediate hospitalization

• Funding is needed urgently



**Thank you for listening!**

Meredith Block  
Program Director  
Blacksmith Institute

Meredith@blacksmithinstitute.org

