



a toxics-free future

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International SAICM Implementation Project (ISIP)

In 2010, in an effort to demonstrate SAICM implementation via IPEN Participating Organizations, IPEN launched an International SAICM Implementation Project, also known as ISIP. ISIP aims to mobilize resources for initial enabling activities pertaining to national priorities, in keeping with the work areas set out in the strategic objectives of section IV of the SAICM Overarching Policy Strategy.

In particular, the ISIP supports the Governance objective of SAICM's Overarching Policy Strategy paragraph 26, which calls for enhanced "cooperation on the sound management of chemicals between Governments, the private sector and civil society at the national, regional and global levels."

In addition, ISIP builds on the 2008-2009 Global SAICM Outreach Campaign to raise awareness about SAICM and strengthen collaboration among the public interest, health and labor sectors.

ISIP Objectives

ISIP's four objectives include:

- Promoting the need for sound chemicals management
- Advancing National SAICM Implementation
- Promoting global SAICM implementation by global civil society
- Building capacity among NGOs developing countries and countries with economies in transition

Title of activity: Addressing Lead Poisoning Exposure Problem in Owino Uhuru Slums-Mombasa, Kenya (Part II)

NGO: Eco-Ethics International - Kenya

Country: Kenya

Date: May, 2012

Elements of SAICM Covered:

Participation in activities related to the Global Partnership to Eliminate Lead Paint including identifying potential lead exposure, raising awareness of toxicity to human health and the environment and alternatives, prevention programs to reduce exposure, and promotion of national regulatory frameworks; Follow up recommendations and options for the SAICM OEWG and ICCM3 (57, 157, ICCM2 decision II/4)

Description of the harms of lead exposure, including suspected harm:

Lead is a commonplace material with widespread usage, it is used in bullets, batteries, fishing sinkers, old toys, and for decades it was an additive in gasoline. Lead has no known essential role in living organisms, and is toxic at even low concentrations. The natural or desirable level of lead in human beings is zero; lead is not used in any way in human metabolism, so there is no tolerable amount. Lead causes symptoms ranging from the loss of neurological function to death depending upon the extent and duration of exposure. Other effects include; brain damage, reduction in blood's ability to carry oxygen, decreased blood production, male infertility, nerve damage, and increase in blood pressure, (Anthony, 1990). Children are particularly vulnerable because at their age, they have smaller body masses and their growing bodies can absorb more lead. Moderate lead exposure is responsible for a significant decrease in school performance, lowering IQ scores, and is linked with hyperactive and violent behavior. Lead poisoning can also affect the unborn child in pregnant women.

Kenya is not an exception, in particular in Owino Uhuru slums which is adjacent to an industrial area. The residents have long complained of chest pains, sneezing, nose irritation, difficulty in breathing, and increased disposition to illnesses. Parents complained of their children having retarded intellectual development, behavioral problems, as well as most of the other problems listed above. All these were said to be likely manifestations of overexposure to lead among the members of the slum community in Owino Uhuru.

Description of the Global Partnership and decision taken at ICCM2, including any national initiatives to advance this decision:

ICCM2 adopted a proposal to form a partnership to promote the global phase-out of lead in paints. This was adopted by governments and all the stakeholders. The broad objective was to promote a phase-out of the manufacture and sale of paints containing lead and eventually eliminate the risks from such paint. This was also to prevent children's exposure to lead from paints containing lead, strengthening monitoring and surveillance efforts and to minimize occupational exposures to lead paint.

On the other hand, the initiative to phase out lead in gasoline could be termed as an international initiative to eliminate lead exposure. Initially, two grades of gasoline; leaded and unleaded were supplied in the Kenyan market. The leaded gasoline was cheaper than the unleaded; most consumers opted for the leaded. The government initiative to eliminate the leaded gasoline was a success since currently there is no leaded gasoline in the Kenyan market.

Description of any existing national laws or policies about lead:

There are no specific laws about lead in Kenya, the EMCA1999, generalizes on the management of toxic and hazardous wastes. However, there is an attempt by NGOs working on heavy metals and related issues to put pressure on the government of Kenya to adopt or come up with something similar to the Residential Lead-Based Paint Hazard Reduction Act of 2010. The Act has the following purposes –

- a) To develop a national strategy to build the infrastructure necessary to eliminate lead-based paint hazards in all housing as expeditiously as possible;
- b) To reorient the national approach to the presence of lead-based paint in housing to implement, on a priority basis, a broad program to evaluate and reduce lead-based paint hazards in the Nation's housing stock;
- c) To encourage effective action to prevent childhood lead poisoning by establishing a workable framework for lead-based paint hazard evaluation and reduction and by ending the current confusion over reasonable standards of care;
- d) To ensure that the existence of lead-based paint hazards is taken into account in the development of Government housing policies and in the sale, rental, and renovation of homes and apartments;
- e) To mobilize national resources expeditiously, through a partnership among all levels of government and the private sector, to develop the most promising, cost-effective methods for evaluating and reducing lead-based paint hazards;
- f) To reduce the threat of childhood lead poisoning in housing owned, assisted, or transferred by the Kenya Government; and
- g) To educate the public concerning the hazards and sources of lead-based paint poisoning and steps to reduce and eliminate such hazards.

Description of types of products available on the market that contain lead:

There are a number of products in the Kenyan market that contain lead. These include bullets, lead – acid batteries, fishing sinkers, old toys, and water pipes.

Description of the levels of lead release and exposure:

Presently, the anthropogenic contribution of heavy metals into the environment far exceeds the natural inputs (Nriagu, 1988). In Kenya, high levels of lead emissions occur mainly in urban centres. This is because of the industrial development and high human population which influences consumption of natural resources and the generation of both liquid and solid wastes. Kimani (2005) found significant exposure to high levels of

environmental lead in Nairobi. Activities to blame include spray painting, panel beating, metal cutting, welding and motor vehicle mechanics. Njoroge et al (2008) identified occupational lead exposure to be at alarming levels in Nairobi, Kenya.

A study in the year 2007 at the areas surrounding Dandora slums in Nairobi, found half the children tested had blood lead levels equal to or exceeding the internationally accepted action levels of 10 micrograms per deciliter of blood, including two children with concentrations of over 29 and 32 micrograms. Tests also showed 42 percent of soil samples had lead levels 10 times higher than what is considered unpolluted soil - more than 400 ppm, compared to a safe level of 50 ppm. Lead levels found on the dumpsite were 13,500 ppm compared to the action levels in The Netherlands of 150 ppm (ENS 2007).

In Kisumu, a study by Selimo et al in 2008, found out that lead content in samples of tap water and other surface water ranged from 140 to 260($\mu\text{g/g}$), and 140 to 690 ($\mu\text{g/g}$), respectively. All the tap water samples had lead content above 10 $\mu\text{g/g}$; the maximum WHO limit for lead in drinking water. The lead content in vegetables and fish ranged between 0.0 to 2.9 and 1.0 to 3.3 ($\mu\text{g/g}$), respectively. All the fish samples had lead levels above the WHO maximum limit of 0.2 ($\mu\text{g/g}$). Lead content in soil samples ranged from 0.2 to 3.9 ($\mu\text{g/g}$).

In Mombasa, a study was done in Makupa Creek system which is in close proximity with Kibarani dumpsite. The study involved determination of the concentrations of lead metal in water, sediment and edible fish species. The mean concentrations for Pb ranged from not detectable (nd) to 0.012 mg/l, 0.2 to 58.0 mg/kg and nd to 59.3 mg/kg in water, sediment and fish samples respectively. These results indicate that there is considerable risk of lead poisoning from drinking water and eating some foods from the contaminated sites.

Describe the concentrations of lead you tested:

A total of 45 different samples were collected from various sources and delivered to the laboratory for the analysis of lead metal. Soil and dust samples were delivered in self sealing plastic bags. Blood samples were delivered absorbed in whatman 4 and dried. Near factory effluent were collected and delivered in capped glass bottles. The soil and dust samples were digested and run into the AAS machine. Water samples were

centrifuged before running into the AAS machine. The concentration of lead in blood was determined by paper disc method postulated by Delves, 1970. The table below shows the summary of the results.

Table 1: Summary of the analysis of lead metal in soil, water and blood samples

Owino Uhuru Area			
Serial No.	Type of sample	No. of Samples	Concentrations of lead metal (mg/L)
1	Soil	5	7.933 mg/L - 25.024 mg/L
2	Roof Dust	9	Below detection limit - 39.598 mg/L
3	Wall Dust	6	45.586mg/L – 207.840 mg/L
4	Blood	10	Below detection limit
5	Blood male duck	1	Below detection limit
5	Effluent water	3	1.50 mg/L – 12.238 mg/L
Maweni Area			
Serial No.	Type of Sample	No. of samples	Concentrations of lead metal (mg/L)
1	Soil	1	2.695 mg/L
2	Wall Dust	11	Below detection limit–16.701mg/L
3	Blood	7	Below detection limit

The soil, effluent water and wall dust lead concentration is high in the Owino Uhuru slums as compared to Maweni primary school. The latter was several kilometres away from the epicentre of lead leakage into the environment – where the leakage was mostly attributed to lead metal recovery from car batteries in a factory based close to Owino Uhuru slums. Therefore there are higher lead concentrations in the Owino Uhuru slum environment than normal. However, this has not translated into alarming blood concentrations. However, scientific evidence shows that the lead blood content in the slum will rise with time among the surrounding community as a result of the relatively high concentrations of the same in the environment especially the surface and ground water.

Project Outcomes:

Description of the activity conducted:

The project had an objective of ensuring that the residents of Owino Uhuru Slum enjoy a clean environment free from lead poisoning exposure as a fundamental right enshrined in the national constitution of Kenya (2010). Specifically the project was to;

1. Research, document and make public the risks of lead poisoning experienced at Owino Uhuru. This was to involve analysis of samples containing lead and the results could be used to prepare policy briefs for lead recycling in Kenya;
2. Mobilize stakeholders to work together toward combating lead poisoning problem at Owino Uhuru;
3. Create massive public awareness on the dangers of lead to the environment and human health, especially to the workers, children and pregnant women;
4. Protect the workers from chemicals posing adverse threats to their health through promoting use of protective equipment;
5. Improve access to and use of information by initiating strategic discussion and exchange of information among stakeholders; and
6. Lobby for proper design and reconstruction of the factory premises to curb lead emissions.

In its implementation, the project started with a stakeholders meeting at the project site i.e. Owino Uhuru Slum. The meeting was convened by the EEI-K staff and the committee of the community group formed during the previous project period. The meeting was to enable the EEI-K staff to know the progress of the community group.

The issues which were addressed included:

1. Reflection of the last project implemented in the year 2011: The participants agreed that the project which was implemented was successful and it brought some positive changes in the operations of the company. However, the emissions were still ongoing, mostly at night.
2. Monitor the progress of the community group formed during the last project period: The community group which was formed was still in place. We learned that there was another committee of ten people which was formed by the local government to monitor the emission status of the company. With these two

groups, the factory was still operating intermittently; sometimes being dormant for a week and then once again beginning operations.

3. Monitor the emission status from the company: The emission from the company decreased, but the factory mostly operated at night thus leading to considerable difficulties in determining the status of emissions. However, the smoke was still dark, showing clearly that the devices which reduce the toxicity of the smoke were not installed.

At the closure of the meeting the EEI-K staffs promised the residents that they were to go back for another meeting.

Later a survey meeting was held between the area chief and the project team. This was to involve the government representatives in the implementation of the project. The chief was introduced to the current project, its goals and the specific objectives. The chief appreciated the relevance of the project, especially to the owners and workers of the metal refinery EPZ limited as well as the residents of Owino Uhuru Slums. He gave EEI-K a go ahead with the implementation of the project and promised to assist whenever they will need his services.

The project team later proceeded to Owino Uhuru Slum to meet the community leaders. The leaders were informed of the current project its objectives and goals. The meeting slotted tentative dates for the various activities and came up with various roles and responsibilities for different players in the project. To inform the community at large, a public rally was planned to take place the week which was following. EEI-K received information from the area chief that for such an event to take place, they had to go for the permit from the OCS of Changamwe Division. EEI-K went to the OCS for the permit the following day.

The public rally was held where an estimated 300 residents attended. The attendants were educated on what lead metal is and why it is classified as a heavy metal, the source of the pollutant (which was the refinery factory), and the exposure pathways (which included inhalation, dermal and through ingestion). Human health and environmental health problems associated with lead metal formed part of the discussions. The residents were taught on the various ways to reduce their exposure to

lead metal and how to combat the lead problem. Many participants claimed that they were already poisoned by the lead dust since they were experiencing most of the symptoms which were mentioned. Most of them were having sleepless nights (insomnia) because of the dark smoke released when the factory operates. The discussion brought about the introduction of the other activity of the project, which was; Research and documentation of lead problem: The concentrations of lead in dust, soil, and water were to be determined. This was to address one of the recommendations from the previous project of providing scientific evidence of the effects of lead in the community. Participants were informed that for them to know if they are really affected, their blood lead levels were to be determined. T-shirts with the information "STOP LEAD POISONING IN SLUMS" were disseminated to the participants.

Research and documentation involved:

a) Testing for blood lead levels of the residents and the workers

Capillary blood was collected from seven willing residents including two children and three workers of the factory. The volunteers were asked of their ages and the number of years have they stayed in Owino Uhuru slum. Blood sample collection was done by finger sterilization using 70% ethanol and then pricking with sterile lancets. Blood sample was also taken from a domestic animal (male duck). The blood lead level was determined by paper disc method postulated by Delves, 1970. The results are shown in Table 1 above. All the individuals tested had no detectable lead levels in their blood.

b) Survey of the lead problem:

A survey was carried out to determine the lead levels in the soils, surface water, and dust from the roof and walls. This was to indicate the level of exposure to lead by the community. In addition, research was done with the residents of Owino Uhuru to assess their levels of understanding of lead poisoning and how they are protecting themselves from lead poisoning. This was also to determine their views towards the existence of the lead extracting factory next to their area of residence.

Sampling locations were strategically selected. The selection depended on the distance from the factory and to which direction of the factory it lays. There were very high concentrations of lead in the stations facing the factory. One house was sampled in both directions; one facing the factory and the other facing the other direction. There were considerable differences in the concentrations in such stations, the direction facing the

factory being very high, 207.840 mg/L and the other side, 23.724 mg/L. There were slight differences in roof dust and soil samples depending on the distance from the factory.

Water samples were strategically collected; one sampling station was the effluent point of the factory, the other station was a community water point where community collects water for use and for drinking by domestic animals. The last station was within a wetland which does not receive the effluent water. The effluent point had high concentration of 12.238 mg/L, the community water point having 11.330 mg/L and the wetland having the low concentration of 1.530 mg/L. This clearly shows the effects of the factory on water sources of the community.

Research and documentation was followed by a stakeholders and factory officials meeting where the laboratory results were shared. However, the factory officials did not attend the meeting, claiming that the process was intended to destabilize their business. It was resolved from the meeting that the factory officials shall be informed of the project objectives.

Mass action was organized by the residents in May, 2012 where the residents peacefully protested against the choking smoke emission from the factory. This further brought the lead poisoning problem at Owino Uhuru to the lime light of the public domain. The use of peaceful demonstrations was one of the advocacy means which were touched upon during the previous project.

The factory workers responded well after the project team requested them to have an educational workshop. The workshop was held, the workers and the factory officials were trained on the various ways to reduce the lead exposure. The factory was advised to install devices which can reduce the emissions. The officials agreed to provide the personal protective gear materials to the workers and ensure that they use them every time they work.

From the workshop, it was agreed that the relevant stakeholders were to inspect the operations of the factory. The officials accepted this on one condition; the stakeholders were not to take pictures. The inspection was done and the officials were advised accordingly depending on the status of the factory.

Impact on target groups:

The project had an aim of reducing the exposure of vulnerable people in Owino Uhuru slums in Mombasa to lead poisoning. Through the implementation of its activities, the project realized following impacts:

- I. Enhanced awareness of stakeholder, nearby population on the dangers of lead to the environment, human health and especially workers, children and pregnant women.
- II. Reduced exposure of factory workers to lead poisoning posing adverse threats to their health through use of protective equipment. The workers were also encouraged on the best practices they can put in place to reduce chances of exposing their families to lead poisoning.
- III. Documented information on lead poisoning risk at Owino Uhuru. There is a scientific paper based on the lead survey which was done, it is in progress, this paper may feature in one of the science journals which will have greater information dissemination. It is anticipated that the paper will be out by the end of October.
- IV. The peaceful demonstration which was done led to filing of a case in the court of law. The case was filed by the villagers in public interest decrying the company's infringement on their right to a clean and healthy environment. The national and environmental management authority was enjoined. However, the case was later withdrawn after the company agreed to align its activities and processes to environmental and safety standards.

Impact on target policies:

Presently, Kenya does not have a lead policy but issues touching on pollution from hazardous wastes and heavy metals are highlighted in the Environmental Management and Coordination Act, 1999. The result of the activities of the project touched on the Occupational Safety and Health Act, 2007 and the proposed Residential Lead-Based paint Hazard Reduction Act, 2010. There was improved knowledge of the workers and the residents on their safety at home and at work place. They were also urged to avoid purchasing products containing lead. With this awareness, the project is expected to provide input towards review of relevant policies and laws at different levels.

Outreach to stakeholders:

The stakeholders engaged in this activity included the Local Government, research institutions, civil society organization, the media, municipal council of Mombasa, National Environmental Management Authority (NEMA), and the public health department. The working relationship which was created has the potential to address such issues now and in future in Kenya. To the workers, company owners and the residents of Owino Uhuru were enlightened on the various ways to reduce their exposure to lead poisoning problem.

Deliverables, outputs and/or products:

Activity	Output
<p>Research and documentation of lead problem at Owino Uhuru slums – which shall involve testing for blood lead levels for the residents and the workers and general survey of the lead problem</p>	<p>A comprehensive study was done in Owino Uhuru and a final report (an activity report) produced. A research paper is being written and disseminated to relevant stakeholders. The paper is yet to be disseminated to the SAICM focal institution for integration into existing policy and development objectives.</p>
<p>Awareness creation – involving public rallies, production and dissemination of information, education and communication materials as well as workers and factory officials educational workshops</p>	<p>The project raised awareness for 400 workers, community members and the factory administrators and other relevant stakeholders. The project held several consultation meetings with community leaders and members. It organized the information Workers and factory officials’ educational workshop and disseminated 50 T-shirts, 50 posters and 5 banners. The project facilitated a public peaceful protest by the residents in May, 2012. The residents peacefully protested against the choking smoke emission from the factory. This further publicized the lead poisoning problem in the project area.</p>
<p>Advocacy campaigns – stakeholder-factory official meetings and joint factory inspections by relevant authorities</p>	<ul style="list-style-type: none"> • The project convened joint factory meetings on several occasions with representatives from different stakeholders. • The factory officials agreed to provide the personal protective gear materials to the workers and ensure that they use them every time they work. • The project has also communicated to the National

	Environmental Management Authority for a full audit of the factory processes and activities. This was done through formal roundtable discussions.
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Communication efforts:

The implementation of the project and throughout the project period, the relevant stakeholders were involved. Each project activity was implemented. The results of the survey of the lead problem and the Blood lead level was shared with the Owino Uhuru residents. There was however no significant media coverage of the project save for a few mentions in newspaper tabloids.

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NGO Recommendations for next steps:

Lead Policy Formulation and Enforcement- there is need for lead policy formulation and enforcement in Kenya. The relevant stakeholders should be involved at all levels during this process.

Proper Urban Planning is a requirement for a sustainable society and sustainable development. There should be strict laws on zoning of urban areas as either residential or industrial areas to avoid/minimize lead exposure to humans and for the proper management of hazardous wastes.

Awareness creation and education- awareness creation and education on the dangers of lead to the environment and human health should be intensified. Majority of the population around the world are still ignorant on lead poisoning. Access to and use of

information and education materials should be improved. Successful stories of case studies should form a major part of the education and awareness creation.

Monitoring the operations of the factory; the operations of the factory should be closely monitored to ensure their conformity with the relevant policies. The workers health should also be closely monitored to check on the exposure to lead. This will determine whether their blood lead level is decreasing, constant or increasing.

Funding- in most development projects, very little amount of the investment goes to environmental betterment. While the polluters, due to corruption practices, may escape the principle of “polluter pays principle” there is need for more funding to environmental advocacy institutions to have these industries monitored against their commitments. To have this realized, more funding will be required to be channeled in this sector.