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Knowledge, Attitudes and Practices Study

Livelihood and Income from the Environment Program Lead Pollution Clean-up in Qalyoubia

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INTRODUCTION

A baseline Knowledge, Attitudes, and Practices (KAP) survey was conducted by the USAID-funded Livelihood and Income from the Environment Program's Lead Pollution Cleanup in Qalyoubia Project (Life-Lead) during January and February 2005. The purpose of the survey was to determine the knowledge, attitudes, and practices of residents and stakeholders regarding pollution in general and lead pollution issues in particular among the smelter area residents in the East District of Shoubra El Kheima. The main findings of the baseline survey indicated the following:

- The environmental problems were not considered by the majority of residents to be a high priority.

- Many community members, especially men, were unaware of the severity of lead pollution problems and did not believe that high levels of lead and other pollutants had an impact on children's health.

- Many residents believed it was the government's responsibility to address the area's pollution problems.

- Important demographic groups, such as school teachers, were unaware of the health hazards of lead exposure for both themselves and their students.

- The majority of women ignored the proper methods to clean and cook food to minimize their family's risk to lead exposure.

- The findings of the baseline KAP survey were used to shape the project's communication strategy. The purposes of the communication strategy included the following:

    - Mobilizing of the local community and stakeholders to support, participate in, and sustain the lead remediation process in Shoubra El Kheima.

    - Raising the awareness of the local community and stakeholders pertaining to the potential health and economic risks associated with industrial pollution.

    - Encouraging the local community and stakeholders to adopt positive attitudes and behaviors for protection against lead and industrial pollution.

    - Coordinating with and equipping local and national institutions, organizations, and pressure groups to support local activities.

Based on the results of the baseline KAP survey, LIFE-Lead identified its target groups among the community, the group leaders, and influential persons and organizations, as well as the best means to reach them. The target groups were divided into primary and secondary groups as described below:

- Primary Target Groups included those residents directly affected by the pollution resulting from the secondary lead smelters located in East Shoubra El Kheima. These groups included the residents dwelling in the LIFE-Lead study area which is defined as being within a one-kilometer radius of the former Awadallah Secondary Lead Smelter No. 1 exhaust stack.

- Secondary Target Groups included the LIFE-Lead stakeholders, effective local community leaders including decision-makers, private businessmen, and competent local organizations. These secondary groups are responsible for decision making in the local community and can influence the primary target groups.

After the identification of the Primary and Secondary Target Groups; goals, objectives, and messages were identified for each target group. In addition, awareness and communication activities were planned. The main topics of the LIFE-Lead communication and awareness messages included the following:

- Health risks of Lead Pollution.
- Previous governmental lead pollution abatement interventions in the area.
- Smelter relocation efforts.
- The critical health impacts of lead pollution on humans in general and on children in particular.
- Measures to be adopted by mothers to protect their families against pollution.
- Proper cleaning methods to minimize lead pollution impacts.
- Proper nutrition required to minimize lead impacts on health.
- Role of residents in solving the lead pollution problems in the study area.
- Role of NGOs and civil community associations in solving the lead pollution problems in the study area.

THE POST-KAP SURVEY AND ITS OBJECTIVES

During July and August 2007, LIFE-Lead conducted a post-KAP intervention survey for the same pre-KAP target community, to measure the impacts of the integrated LIFE-Lead technical and communication initiatives. The study objectives included the following:

- Comparing the levels of knowledge, attitudes, and practices of the target groups with their initial status after being exposed to the project messages and activities. The post-KAP survey was conducted to track the same population that was surveyed in the initial baseline study. This population community was represented in both studies by a standardized random sample.
- Identifying the changes witnessed in the knowledge and attitudes of stakeholders, including a representative sample of the opinion leaders, governmental officials, decision-makers, and community organizations in the study area.

POST-KAP SURVEY STEPS

Data Collection Team

Seven researchers from the local community were employed to collect the required information. All researchers had an academic background in social services. During the period from July 16 through19, 2008, the LIFE-Lead Community Participation and Communication team conducted a training session for the field research stages and skills.

The session addressed the means to qualify and equip the data collection team members with the required knowledge and skills needed for collecting the field data.

Methodology and Sample Design

To achieve the aforementioned survey objectives, this post-KAP survey was designed by adopting the same pre-KAP survey steps as described in the following:

- Using a standardized random sample, typically applied in social research to ensure the sample representation of all community categories, either in terms of gender, age, educational level, or geographical location.
- Classifying the project study area into selected zones and groups of individuals from among the residents of the East District of Shoubra El Kheima according to their age groups, educational and social levels, and gender.
- Cooperating with the previous data collection team (pre-KAP) to collect the post-KAP data.
- Collecting relevant field data in line with the designed sample and relevant geographical location to ensure covering all selected zones in the study area.
- Data entry and analysis was conducted using the Statistical Package for Social Sciences (SPSS).

Questionnaire Design

The baseline KAP male, female, and stakeholder questionnaires were modified to meet the post-KAP objectives. For example:

- Some questions fulfilled their purpose and were excluded and others were added or rephrased to measure the accomplishments of LIFE-Lead communication and technical interventions.
- An attitude scale was designed in order to compare the pre and post-KAP results.

Similar to the pre-KAP survey, the residents sample included males and females to identify the statistical variance between both genders in their levels of knowledge, attitudes, and practices. Most of the questions addressed both males and females, while some were designed specifically for each. For example, the survey has specified females with questions for the purpose of identifying the following:

- Their children's cleanliness habits because as mothers they are capable of observing and guiding their children's behavior to protect them from pollution hazards.
- Their cooking habits in terms of ensuring the cleanness of utensils and food ingredients as well as their own personal cleanness during food preparation.
- Their level of awareness regarding food pollutants, since as females they are directly concerned and traditionally charged with food preparation and children tidiness.
- Female habits and methods of home cleaning and handling of any existing indoor pollution.

- Females/mothers awareness of the proper and healthy mineral-rich nutrition that reduces the hazardous impacts of lead pollution.

On the other hand, the male survey questionnaire included different questions aimed to identify their actual work practices inside workshops and smelters. These questions were directed to ensure male workers commitment to adoption of safety procedures in order to protect themselves from the risks of exposure to lead and other metal wastes.

A different questionnaire was used for the stakeholders because they have an influence on the Primary Target Groups. The stakeholder questionnaire identified their roles and effectiveness in the community.

Survey Sample

Residents--

A total of 300 samples were taken for this KAP Study. The samples were divided by gender (150 males and 150 females) and distributed geographically to various selected zones in the study area. Every researcher was requested to obtain the sample from each zone individually. Data were collected from the areas of Menoufia, Salam City, Ezbet Selim, from the residences overlooking Rashah Mostorod and the Gabbasat, and from the cottages adjacent to the Seoudi and Awadallah Smelters (Al-Wehda Al-Arabeya residences overlooking the Ismailia Canal).

Stakeholders--

The stakeholders sample selected for the post-KAP survey consisted of 50 individuals including: Mosques Imams, Christian Priests, NGO officials, schools and educational department staff, district representatives, local media and cultural center officials, Shoubra El Kheima librarians, Nile Media Center staff, and Kablat Medical Center workers.

RESULTS OF POST- KAP SURVEY

The pre-KAP survey issued a concluding standard report on residents and stakeholders. However, due to the nature of the post-KAP survey, the relevant report shall exhibit the results of the survey as follows:

- Section 1.0: Includes a comparison of knowledge, attitudes and practices of selected residents in the East Shoubra El Kheima District.

- Section 2.0: Includes a comparison of knowledge, attitudes, and practices of stakeholders in the same study area.

It is noteworthy that the following sections of this report included analyses and comparisons between pre and post-KAP results. In addition, analyses of changes (nonexistent in the pre-KAP survey) were included in the post-KAP survey.

SECTION 1.0: RESULTS OF THE POST-KAP SURVEY OF RESIDENTS IN THE STUDY AREA

Comparing Pre and Post-KAP Survey Samples of Residents

The total number of pre-KAP survey samples was 350 males and females, where each gender group included 175 married or single males and females. However, in the post-KAP

survey the total number of samples was 300 males and females, where each gender group included 150 married or single males and 150 married or family-supporter females. Table 1.1 presents a comparison and distribution of those interviewed in both surveys as follows:

Table 1.1: Comparing Pre and Post-KAP Survey Samples of Residents

Sample Description Category		Pre-KAP Survey	Post-KAP Survey
		%	%
Age Group	< 20 years old	10	10
	20 –30 years old	19	33.5
	30-40 years old	37	29.5
	> 40 years old	34	27
Totals		**100**	**100**
Profession	Private Business	66	41
	Government employee	14	18
	Unemployed	20	41
Totals		**100**	**100**
Educational Level	Illiterate	35	17
	Literate	16	24.5
	High School	37	45.5
	University Education	12	13
Totals		**100**	**100**
Residential Location	Menoufia	33	24
	Ezbet Abou Selim	31	20
	Rashah Mostorod	17	19
	Al-Gabbasat	14	11
	Residences adjacent to Seoudi and Awadallah Smelters	10	25
Totals		**100**	**100**

Assessment of the Knowledge Aspects of Residents (Males and Females) Regarding the Lead Pollution Problem

Residents' Definition of "Environment"--

To ensure their understanding of the survey objective, the interviewed residents were asked about their definition of "environment". Attempting to unify concepts among those interviewed who gave inaccurate responses, the research team explained the term "environment" according to the Environment Law as follows: "*The environment is the biosphere which encompasses living organisms together with the substances it contains and the air, water, and soil that surround it, as well as the establishments set up by man"*. This explanation was provided to those interviewed at the beginning of the survey to help them understand the questions properly. Table 1.2 shows the definition of "environment" given by respondents and frequency rates of the same responses.

Table 1.2: Comparing Pre and Post-KAP Survey Results
Resident Definition of "Environment"

Resident Definition of Environment	Post-KAP Survey		Pre-KAP Survey	
	Frequency	%	Frequency	%
All human surroundings	123	38	56	16.0
Air. water, food, and soil	114	35	185	52.9
Environmental pollutants	82	25	42	12.0
Other definitions	8	2	-	19.1
Totals	**327**	**100**	**283**	**100**

In pre and post-KAP surveys, the total number of responses exceeds the number of respondents due to accepting more than one response.

The following is a summary of the results presented in Table 1.2:

- In this post-KAP survey, 38% of respondents defined environment as all human surroundings, compared to 16% who gave the same response in the pre-KAP survey. This increase is attributed to the LIFE-Lead communication and awareness interventions aimed to draw the residents' attention to the hazards of industrial pollution.

- 25% of the respondents defined environment as environmental pollutants, compared to 12% who gave the same response in the pre-KAP survey.

- 35% of the respondents defined the environment as air, water, food, and soil compared to 52.9% who gave the same response in the pre-KAP survey. This increase is attributed to the LIFE-Lead communication and awareness interventions aimed to draw the attention of the residents to the hazards of industrial pollution.

- 2% of the respondents gave other definitions to "environment" compared to 19.1% who gave varied definitions in the pre-KAP survey. These definitions describing environment as "bad people" due to their confused concept of the term environment with a local definition of bad people as "Bee'ah" (Arabic) meaning bad or dangerous people. This increase is attributed to the LIFE-Lead communication and awareness interventions aimed to draw the attention of the residents to the hazards of industrial pollution.

Resident Awareness of Pollution Aspects in the Study Area--

Respondents were asked to identify aspects that indicate their recognition of pollution existing within the area where they live. Table 1.3 presents the residents' perception of these types of pollution and the corresponding percentage of responses.

Table 1.3: Comparing Pre and Post-KAP Survey Results
Residents Recognition of Pollution Aspects in Study Areas

Pollution Aspects	Post-KAP Survey		Pre-KAP Survey	
	Frequency	%	Frequency	%
Industrial pollution (heavy smoke and pollutants resulting from industrial facilities and smelters)	584	72	64	16
Air, water, and soil pollution	114	14	267	70
Pollution at schools and hospitals	51	6	2	0.5
Pollution carried by clothes	33	4	46	12
Garbage (solid wastes)	32	4	6	1.5
Totals	**814**	**100**	**394**	**100**

In pre and post-KAP surveys, the total number of responses exceeds the number of respondents due to accepting more than one response.

The post-KAP survey results indicated a general improvement in resident recognition of pollution aspects in the study area, which can be summarized as follows:

- 72% of the respondents indicated the aspects of pollution they recognized to be resulting from the industrial facilities and smelters, compared to 16% in the pre-KAP survey. This increase is attributed to the LIFE-Lead communication and awareness interventions aimed to draw the attention of the residents to the hazards of industrial pollution.

- 6% of the respondents indicated that schools and hospitals pollution is another pollution aspect compared to 0.5% in the pre-KAP survey. This recognition can be attributed to the LIFE-Lead project efforts in cleaning up and remediation of the Ahmed Shalaan and Delta Solb Schools and the Kablat Medical Center.

Resident Views on Persistence of Lead Pollution Problem in Study Area--

In the pre-KAP study, the residents were asked whether they thought there was a lead pollution problem in the area. The post-KAP resident sample was asked to voice their views about the persistence of the lead pollution problem in the area after the LIFE-Lead remediation efforts. Table 1.4 compares the results of both questions for the pre and post-KAP studies.

Table 1.4: Comparing Pre and Post-KAP Survey Results
Residents Views on the Existence/Persistence of the Lead Pollution Problem

Perceptions on Persistence of Lead Pollution Problem	Post-KAP Survey		Pre-KAP Survey		Statistical Variance
	Frequency	%	Frequency	%	
Yes	140	47	312	89	- 42
No	134	45	26	7	+ 38
Do not know	26	8	12	4	+ 4
Totals	**300**	**100**	**350**	**100**	

The following describes the differences in the Table 1.4 results between the pre and post-KAP surveys:

- 47% of the respondents still believed in the persistence of the lead pollution problem in the study area, compared to 89% who believed the problem existed in the pre-KAP survey, indicating a statistical variance of (-42). Although this decrease is attributed to the LIFE-Lead remediation efforts in the study area, the post-KAP percentage (47%) is still high in spite of the LIFE-Lead awareness interventions due to the following:

  - The LIFE-Lead awareness messages focused on the accomplished remediation of schools, smelters, and the Kablat Medical Center sites as a means to eliminate pollution sources. However, residents had to be informed of the significant pollution levels in the surrounding streets to encourage them to adopt sound behaviors to minimize pollution impacts. The project communication activities explained the persistence of the problem in the surrounding streets.

  - Some interviewed individuals may not be fully aware of the LIFE-Lead interventions, since they might not have been exposed to all or some of the project awareness activities.

- 45% of the respondents stated that the lead pollution problem does not exist any longer in the study area, compared to 7% who had the same response in the pre-KAP survey, with a statistical variance of (+38). This result may be attributed to the increasing confidence of residents in recognizing the LIFE-Lead remediation interventions as fruitful.

- 6% of the audience stated that they do not know whether the problem persists or not.

Resident Views on the Persistence of Lead Pollution Hazards--

Residents were asked about their views on the persistence of the lead pollution hazards in the study area. Their responses are listed in Table 1.5.

Table 1.5: Comparing Pre and Post-KAP Survey Results
Residents' Views on Persistence of the Lead Pollution Hazards

Residents Views on Persistence of Lead Pollution Hazards	Post-KAP Results		Pre-KAP Results		Statistical Variance
	Frequency	%	Frequency	%	
Not hazardous anymore	160	54	1	0.5	+53.5
Still very hazardous	126	42	266	85	-43
Hazardous to some extent	13	4	45	14.5	-10.5
Totals	**299**	**100**	**312**	**100**	

The following provides a summary of the resident views on the persistence of lead pollution hazards:

- 54% of the respondents are convinced that the lead pollution hazards are not persistent anymore, compared to a very minor 0.5% who had the same views before LIFE-Lead remediation activities.

- 42% of the respondents believed that lead pollution in the area is very hazardous, compared to a high of 85% who gave the same response before remediation, indicating a statistical variance of (–43). This reduction can be attributed to the fact that those residents believe that relocation of smelters and the LIFE-Lead remediation efforts have reduced the hazards of lead pollution.

- 4% of the respondents stated that the lead pollution hazards are still persistent to some extent, compared to 14.5% who gave the same response in the pre-KAP survey.

Resident Knowledge of LIFE-Lead Remediation Efforts in the Study Area

Residents were asked if they ever witnessed or heard about any LIFE-Lead remediation efforts in smelters, schools, and medical center sites in the study area. Their responses are listed in the following Table 1.6.

Table 1.6: Resident Knowledge about LIFE-Lead Remediation Efforts in the Study Area

Knowledge of Remediation Initiatives	Males		Females		Total	
	Frequency	%	Frequency	%	Frequency	%
Yes	122	81.3	129	86	251	84
No	28	18.7	21	14	49	16
Totals	**150**	**100**	**150**	**100**	**300**	**100**

Eighty-four percent (84%) of total interviewed males and females confirmed their knowledge about the LIFE-Lead remediation efforts in the study area, while 16% indicated they never heard about these efforts.

This result indicates that the LIFE-Lead remediation efforts were clear enough to attract the attention of the majority of residents. This result is further supported by previous results in Table 1.5 in which a higher percentage of interviewed residents are currently convinced that the lead pollution problem in the study area is not as hazardous today as compared to relevant pre-KAP survey results.

Resident Information Sources about Lead Pollution--

The LIFE-Lead Communication Strategy adopted direct communication approaches to address the residents of the East Shoubra El Kheima District. Hence, it was necessary to identify the most effective communication channels the public audience uses to obtain their information in the pre-KAP survey. Based on the results of the pre-KAP survey, a communication strategy and plan were developed that employed effective communication channels and methods.

The results obtained from the pre-KAP survey indicated that residents (males and females) depended largely on the mass media in obtaining information. However, the LIFE-Lead communication strategy adopted direct communication approaches as the best means for achieving the project's purposes due to the following considerations:

- The geographical zone covered by the LIFE-Lead project is relatively limited, and if mass media channels are used, the financial costs will be too high compared to expected minor impacts.

- The direct communication approaches are the most proper and highly effective in dealing with changing attitudes and practices, which constitutes an urgent need in the lead pollution issue in the study area.

- The direct communication approaches, which follow several tactics, including face-to-face communication will likely have deep and extended impacts compared to mass media impacts.

Results of the analyses of the statistical variances between the interviewed resident responses in the pre and post-KAP intervention surveys are provided in Table 1.7.

Table 1.7: Comparing Pre and Post-KAP Survey Results
Resident Information Sources about the Lead Pollution Problem in the Study Area

Residents' Information Sources about Lead Pollution Problem		Post-KAP Results Total		Pre-KAP Results Total		Statistical Variances
		Frequency	%	Frequency	%	
Information Sources (defined in LIFE-Lead Strategy)	LIFE-Lead Team	132	30	-		+30
	Kablat Medical Center	46	11	-		+11
	Adult Education Classes	27	6	7	1	+5
	Children at School	26	5	-		+5
	Mosque	24	5	28	4	+1
	Library	4	2	-		+2
	Culture Palace	3	1	-		+1
	Church	2	1	-		+1
Total Direct Information Sources (Identified in LIFE-Lead Communication Strategy)		**264**	**61**	**35**	**5**	**+65**
Total Indirect Sources of Information	**Friends, Mass Media, District/City Council/Government Officials**	**171**	**39**	**491**	**78**	**-39**
No Source of Information		-	-	95	15	-15
Others		-	-	12	2	-2
Totals		**435**	**100**	**633**	**100**	

In the pre and post-KAP surveys, the total number of responses exceeds the number of respondents due to accepting more than one response.

The following provides a summary of the resident's views on information sources pertaining to lead pollution:

- 61% of the respondents indicated that the direct information sources, as identified in the LIFE-Lead Communication Strategy, served as their actual information sources about the lead pollution problem. While 39% of respondents stated that they obtained their information about lead pollution from indirect sources, which indicates a statistical variance of (+56) for the direct sources. The male-female statistical knowledge variances were consistent with the LIFE-Lead strategy and interventions.

- 30% of the respondents placed the LIFE-Lead team as their first direct information source. It is noteworthy that this source did not exist in the pre-KAP survey, since the LIFE-Lead communication efforts were not fully recognized at that point.

- In this post-KAP survey, respondents selected new sources of information that emerged for the first time, such as the Kablat Medical Center (10.5%), children at school (6%), the library (1%), and the church and culture palace (both 0.5%).

- 6% of the respondents underlined the improved role of adult education classes, compared to just 1% who selected those classes in the pre-KAP survey.

Resident Knowledge of Health Hazards Caused by the Exposure to Lead Pollution--

Residents were asked about their knowledge of the health hazards resulting from exposure to lead pollution. Their responses are provided in Table 1.8.

Table 1.8: Resident Knowledge of Health Hazards

Resident Knowledge of Health Hazards	Pre-KAP Survey		Post-KAP Survey	
	Frequency	%	Frequency	%
Yes	204	58.3	300	100
No	146	41.7	-	-
Totals	**350**	**100**	**300**	**100**

In the post-KAP survey, all respondents confirmed their knowledge of the negative health hazards of lead pollution, while in the pre-KAP survey, only 58.3% and 41.7% confirmed their knowledge and ignorance of those hazards, respectively. The post-KAP survey results indicate clearly the major role played by the LIFE-Lead awareness and community participation efforts in the target local community during the period between the pre and post-KAP surveys.

Resident Knowledge of Remediated Sites in the Study Area--

This question reflects the interviewed resident's knowledge of the remediated sites. The responses indicated that 84% of respondents (251 individuals) affirmed their knowledge of the LIFE-Lead technical interventions to remediate the lead polluted sites (Table 1.6). Responses have clearly identified that the majority of the interviewed residents knew about one or more of LIFE-Lead remediated sites, as indicated in Table 1.9.

Table 1.9: Resident Knowledge of Remediated Sites in the Study Area

Remediated Sites Known or Seen by Residents		Males	Females	Total
Ahmed Shalaan School	Frequency	92	91	163
	%	44	56	23%
Awadallah Smelters	Frequency	77	76	153
	%	50	50	21%
El-Mahy Smelter	Frequency	79	58	137
	%	58	42	19%
Kablat Medical Center	Frequency	39	73	112
	%	35	65	16%
Seoudi Smelter	Frequency	46	30	76
	%	61	39	11%
Delta Solb School	Frequency	22	28	50
	%	44	56	7%
Khaled Saad Smelter	Frequency	12	1	13
	%	92	8	2%
Osama Zakaria Smelter	Frequency	11	1	12
	%	92	8	2%
Totals		**358**	**358**	**716**

The total number of responses exceeds the number of questionnaire interviewees due to accepting more than one response.

The following provides a summary of the resident's knowledge of contaminated sites remediated by LIFE-Lead:

- The Ahmed Shalaan School has gained the highest attention of the residents to the LIFE-Lead remediation initiatives, as it was referred to by 23% of total residents interviewed, of which females constituted the highest percentage (56%) in comparison to males (44%). This higher female knowledge may be attributed to children at this school who drew their mothers' attention to the ongoing remediation process at the school.

- Awadallah and El Mahy Smelters were the second and third most known sites respectively (21% and 19%) among the sites that male and female residents have either witnessed or heard about their remediation. This may be attributed to the preliminary LIFE-Lead communication phases targeted at the public, during which the project planned technical remediation activities were explained to the residents.

- The Kablat Medical Center was the fourth most well known remediated site as indicated by 16% of respondents. Again, females constituted the highest percentage (65%), compared to males (35%). This marks a most likely result, as females, including mothers, are more in contact with the Kablat Medical Center compared to males.

Resident Knowledge of Agencies Involved in Solving the Lead Pollution Problem in the Study Area--

Residents were asked about their knowledge of the parties or agencies that participated in solving the lead pollution problem in the study area. Their responses are provided in Table 1.10.

Table 1.10: Resident Knowledge of Parties Involved in Solving the Lead Pollution Problem

Parties Involved in the Solving Lead Pollution Problem	Post-KAP Intervention Survey					
	Males		Females		Total	
	Frequency	%	Frequency	%	Frequency	%
Ministry of Environment (MSEA) with LIFE-Lead	52	45	34	35	86	40
LIFE-Lead Project	22	19	24	25	46	22
East Shoubra El Kheima District Authority with LIFE-Lead	24	21	19	20	43	20
USAID with LIFE-Lead	10	9	19	20	29	13.5
Governorate with LIFE-Lead	7	6	1	1	8	4
Local Council with LIFE-Lead	1	1	-	-	1	0.5
Totals	**116**		**97**		**213**	

Taking into consideration the effective and satisfactory partnership of those agencies with the LIFE-Lead project in this regard, the aforementioned responses can be analyzed as follows:

- LIFE-Lead partnership with Ministry of State for Environmental Affairs was quite well known by a high percentage (40%) of the interviewed residents.

- The LIFE-Lead project was mentioned solely by 22% of the total respondents as a single party involved in solving the lead pollution problem in the study area.

- The district authority efforts in collaboration with LIFE-Lead were identified by 20% of respondents as the third party involved.

- LIFE-Lead and USAID participation in these efforts were indicated by 13% of those interviewed as the fourth involved party, 20% by females and 9% by males.

Resident Awareness of Health Hazards Resulting from Exposure to Lead Pollution

Resident' Awareness of Food Contaminants--

Residents were asked about their knowledge of the health hazards resulting from exposure to lead pollution. Their responses are presented in the Table 1.11, which compares pre and post-KAP survey results regarding their recognition of food contaminants:

Table 1.11: Comparing Pre and Post-KAP Survey Results
Resident Knowledge of Food Contaminants

Food Contaminants (Categories)	Post-KAP Survey		Pre-KAP Survey	
	Frequency	%	Frequency	%
Dust	212	43	138	36
Insecticides	203	41	172	44
Vehicle Emissions	44	9	18	5
Lead	33	7	20	5
Insects	-	-	5	1
Microbes	-	-	9	2
Pollution	-	-	8	2
All the aforementioned responses	-	-	5	1
Water Tanks	-	-	2	0.5
Deficient Storage	-	-	1	0.2
Chemicals	-	-	7	2
Unregistered Salesmen	-	-	1	0.2
Animals	-	-	1	0.2
Totals	**492**	**100**	**387**	**100**

In the pre and post-KAP surveys, the total number of responses exceeds the number of interviewees due to accepting more than one response.

The following provides a summary of the resident's knowledge of food contamination caused by industrial pollutants:

- Dust was indicated by 43% of male and female respondents as the prime cause of food contamination, instead of insecticides, which was cited as the prime food contaminant by 44% of respondents in the pre-KAP survey.

- In the post-KAP survey, insecticides came next on the list of food contaminants according to 41% of male and female respondents, instead of dust which ranked second by 36% of respondents in the pre-KAP survey.

- Vehicle emissions were described as the third most recognized food contaminant in the results of both pre and post-KAP survey results by 5% and 9% of respondents respectively.

The significance of categorizing dust as the most currently recognized main food contaminant in the post-KAP survey means that LIFE-Lead awareness messages have succeeded in convincing the residents that dust is a major pollution route.

Resident Awareness of Health Affected Population Categories Due to Lead Pollution--

The residents were asked to identify the population categories that are most highly affected health wise from exposure to lead hazards. Their responses are presented in Table 1.12.

Table 1.12: Resident Knowledge of Health Affected Population Categories Due to Exposure to Lead Pollution

Population Affected by Lead Pollution	Males		Females		Total	
	Frequency	%	Frequency	%	Frequency	%
All Categories	83	38	81	37	164	38
Children	66	30	67	31	133	30
Adults	30	14	25	11	55	13
Lead Smelters Workers	34	16	17	8	51	12
Pregnant Mothers	5	2	28	13	33	8
Breast Feeding Mothers	1	0.5	-	-	1	-
Totals	**219**	**100**	**218**	**100**	**437**	**100**

In the pre and post-KAP surveys, the total number of responses exceeds the number of interviewees due to accepting more than one response.

The following provides a summary of the resident views on those affected by lead pollution:

- 38% of the public audience did not differentiate between categories in terms of being affected by health hazards resulting from exposure to lead.
- 30% indicated that children are the highly affected category when exposed to these hazards. This result indicates the raised level of public awareness regarding the dangerous health impacts on children if exposed to lead hazards, a concept that was the main focus of the LIFE-Lead awareness and communication campaign.
- Resident views on adult and smelters workers exposure to health hazards due to lead pollution were nearly the same, as indicated by 13% and 12% for the two categories respectively.
- Pregnant mothers constituted 8% of the respondent views as the least category exposed to health hazards due to lead pollution.

Resident Knowledge of the Types of Health Effects on Children Exposed to Lead Pollution--

Residents were asked about their knowledge of the types of health hazards and diseases that affect children exposed to lead pollution. Their responses are presented in Table 1.13.

Table 1.13: Resident Knowledge of the Health Effects on Children Exposed to Lead

How Lead Negatively Affects Children's Health	Males		Females		Total	
	Frequency	%	Frequency	%	Frequency	%
Immunity system	117	33	129	30	246	32
Asthma	86	24	73	17	159	20
Cancer	39	11	29	7	68	9
Nervous system and kidneys	20	6	35	8	55	7
Anemia	13	4	43	10	56	7
Intelligence	25	7	29	7	54	7
Muscle-Nerve disorder	8	2	45	11	53	7
Deficiency in bone and muscle growth	34	10	19	4	53	7
Learning Disabilities	2	0.5	12	3	14	2
Respiratory system	8	2	4	1	12	2
Speaking disabilities	2	0.5	5	1	7	1
Totals	**354**	**100**	**423**	**100**	**777**	**100**

The total number of responses exceeds the number of questionnaire interviewees due to accepting more than one response.

The following provides a summary of the resident knowledge of health effects on children exposed to lead:

- 31% of the total respondents considered that immunity system impairment is the most dangerous health risk for children exposed to lead pollution.
- 20% of the total interviewed indicated that children may be infected with asthma due to their exposure to lead pollution.
- 9% ranked cancer next due to the exposure of children to lead hazards.
- 7% of the total respondents equally indicated that children exposed to lead pollution may suffer affects to their nervous system, kidney damage, anemia, intelligence problems, muscle-nerve disorders, and deficient bone and muscle growth.

Resident Awareness of Dangers that may Affect Children Playing in Streets--

Table 1.14 compares between pre and post-KAP survey results regarding respondent recognition of the type of dangers that children may be exposed to while playing in streets.

Table 1.14: Comparing Pre and Post-KAP Survey Results
Resident (Males/Females) Recognition of Hazards Affecting Children Playing in Streets

Reasons for Resident Concerns for Children's Outdoor Play	Post-KAP Intervention Survey						Pre-KAP Intervention Survey						Statistical Variances
	Males		Females		Total		Males		Females		Total		
	F	%	F	%	F	%	F	%	F	%	F	%	
Car Accidents	79	50	84	51	163	50	61	50	95	56	156	53	-3
Outdoor Pollution	55	35	52	32	107	33	23	19	39	23	62	21	125
Other Children	25	15	28	17	53	17	33	33	21	12	54	18	-1
Learning Bad Words	-	-	-	-	3	2	9	5	9	5	12	4	
Electric Shock	-	-	-	-	2	2	7	4	7	4	10	4	
Totals	**159**		**164**		**323**		**123**		**171**		**294**		

In the pre and post-KAP surveys, the total number of responses exceeds the number of interviewees due to accepting more than one response.

The following provides a summary of the resident's reasons for concern about children playing outside:

- 50% of the residents interviewed (males and females) voiced concern over their children's exposure to car accidents while playing in the streets. No statistical variances were recognized between males and females regarding such concern during the period between the pre and post-KAP surveys, as it reached 53% and 50%, respectively.

- The most recognized statistical variance between both surveys was the residents concern over their children's exposure to outdoor pollution (outside homes) as this percentage increased from 21% in the pre-KAP survey to 33% in the post-KAP survey, indicating a statistical variance of (+12). This increase confirms the role of LIFE-Lead in raising residents' awareness regarding the pollution hazards to which their children may be exposed while playing in the streets.

- Resident concern over their children's potential exposure to attacks by their playmates remained almost constant, as it slightly decreased from 18% in the pre-KAP survey to 17% in the post-KAP survey.

General Attitudes of Residents Regarding the Lead Pollution Problem and Smelter Hazards

Assessment of Statistical Variances in Residents' Attitudes Regarding the Lead Pollution Problem--

Table 1.15 indicates the results of measuring the resident positive attitudes (represented in relocation of lead smelters from the residential area due to their hazards), and their negative attitudes (represented in keeping lead smelters in the area).

Table 1.15: Comparing Pre and Post-KAP Survey Results
Resident Attitudes Regarding the Lead Pollution Problem and Smelter Hazards

Audience Attitudes	Post-KAP Survey Results	Pre-KAP Survey Results	Statistical Variances
	%	%	
Positive attitudes in support of smelters relocation due to their health hazards	64	69.45	4.45
Neutral attitudes	33	7.45	-25.55
Negative attitudes in support of keeping smelters in the area	3	23.15	20.15
Totals	**100**	**100**	

The following provides a summary of the resident attitudes regarding the lead pollution problem and smelter hazards:

- 64% of the residents confirmed their support for removal or relocation of smelters, compared to 69.45% who had the same opinion in the pre-KAP survey.

- 7.45% registered neutral attitudes, compared to 33% who gave the same attitude in the pre-KAP survey.

- 23.15% supported keeping the smelters in the study area in the post-KAP survey, compared to 3% who supported relocation in the pre-KAP survey.

By analyzing these results, the following can be concluded:

- Despite the drop in the percentages of smelter relocation supporters in the post-KAP survey in comparison to the pre-KAP survey, the statistical variance is slight, indicating that this drop is quite ineffective. However, the attitude change is quite obvious in the significant drop in supporters for keeping smelters in the study area in comparison to the same category in the pre-KAP survey.

- This change in attitude is supported by analyzing knowledge results in the aforementioned tables, which indicate the high public awareness of the lead pollution problem as well as the remediation activities and their advantages. This confirms that sometimes a change in knowledge may be associated with a change in attitude.

- This drop in supporters of smelter relocation after the LIFE-Lead remediation activities should be studied. As this drop may be attributed to economic problems witnessed by smelters workers living in the area, who despite their knowledge and awareness of the health hazards resulting from these smelters as indicated in this study, may not find a secure economic alternative in the case of relocating these smelters to a remote area.

Factors Affecting Increased Resident Concerns about Solving the Lead Pollution Problem--

The survey monitored the resident attitudes (males and females) regarding the factors affecting their heightened concern about the lead pollution problem. The results are provided in Table 1.16.

Table 1.16: Comparing Pre and Post-KAP Survey Results Reasons Leading to Increased Resident Concerns about Solving the Lead Pollution Problem

Reasons for Resident Concern to Solve the Problem	Post-KAP Survey Results						Pre-KAP Survey Results		
	Males		Females		Total		General Public		Statistical Variance
	F	%	F.	%	F	%	F	%	
Resident concern about potential health problems	81	62	70	45	151	53	240	53.5	-0.5
LIFE-Lead Communication Team	16	12	39	25	55	19	69	15	+4
Law enforcement and smelter closures	12	9	13	8	25	8	59	13	-5
Resident recognition of their losses	13	10	11	7	24	8	43	9.5	-1.5
Spread of cancer	6	5	11	7	17	6	-	-	+6
Impact on children at school	2	2	12	8	14	5	27	6	-1
Others*	-	-	-	-	-	-	11	2	-2
Totals	**130**	**100**	**156**	**100**	**286**	**100**	**449**	**100**	

In the pre and post-KAP surveys, the total number of responses exceeds the number of interviewees due to accepting more than one response.

**Includes NGOs, cases of emergency response, mass media, government supervision, and socio-economic improvements.*

The following provides a summary of the resident reasons for concern pertaining to solving the lead pollution problem:

- Fears aroused from health problems resulting from lead pollution were the prime reason that resulted in 53% of the residents in the post-KAP survey to be concerned about the lead pollution problem, divided among 62% of males and 45% of females.

- The LIFE-Lead awareness and communication initiatives constituted the second reason that increased the concern of 19% of the residents about the lead pollution problem, divided as 25% of females and 12% of males. Females outnumbered males since the LIFE-Lead communication efforts were more focused towards females and children.

- Losses recognized and incurred by 8% of the residents due to lead pollution were the third reason for their concern about the lead pollution problem. This percentage was the same for other reasons cited such as those requesting law enforcement and smelter closure in this post-KAP survey.

- A new variable has emerged in the post-KAP survey, as 6% of residents indicated that the spread of cancer was their pressing concern pertaining to the lead pollution problem. This factor did not emerge in the pre-KAP survey.

On analyzing comparative pre/post-KAP results, it is obvious that residents increased concern for solving the problem was mainly based on facts and actual reasons while

concern in the pre-KAP survey were mere anticipations by residents interested in solving the lead pollution problem.

Assessment of Resident Practices Regarding the Lead Pollution Problem

Residents Participation in Discussing Environmental Problems with Others--

The aspect of resident practices is meant to identify their mental and physical behavior towards lead pollution in the study area. Table 1.17 indicates the level of residents participation in discussing environmental problems with others in order to identify their behavior pattern.

Table 1.17: Resident Participation in Discussing Environmental Problems with Others

Residents Participation in Discussing Environmental Problems with Others	Males		Females		Total	
	Freq.	%	Freq.	%	Freq.	%
Yes	69	56	86	66	155	61
No	54	44	45	34	99	39
Totals	**123**	**100**	**131**	**100**	**254**	**100**

This question was not answered by all interviewees.

Sixty-one percent (61%) of residents indicated their participation in discussing the common environmental pollution problems in the study area, while 39% denied their participation in these discussions. This result indicates an increase in the number of participants in these discussions, especially in favor of the more active females (66%) compared to males (56%).

Resident Participation by Advising Others on Environmental Protection--

Based on the survey's conclusion about the level of resident concern about environmental issues, they were asked about changing their role from participation in relevant discussions to a more effective and positive roles such as advising others. Their responses are provided in Table 1.18.

Table 1.18: Resident Role of Advising Others on Environmental Protection

Participation in Advising Others On Necessary Environmental Protection	Males		Females		Total	
	Freq.	%	Freq.	%	Freq.	%
Yes	78	63	77	59	155	61
No	45	37	53	41	98	39
Totals	**123**		**130**		**253**	

This question was not answered by all interviewees.

Sixty-one percent (61%) of residents (males and females) indicated they had a role in advising others on environmental protection, compared to 39% who indicated they did not play that role. This phase represents a consecutive step for public residents concerned with environmental issues, which moves beyond the increased concern towards effective and positive participation. This positive implication is a clear result of the LIFE-Lead communication efforts.

Resident Participation in Cleaning the Study Area of Lead Pollution

Respondents were asked about their participation in efforts targeted for remediation or cleaning the area of lead pollution. The majority responded negatively as indicated in Table 1.19.

Table 1.19: Resident Participation in Cleaning the Area

Interviewees Participation in Cleaning the Area from Lead Pollution	Frequency	%
No	236	93
Yes	17	7
Total	**253**	

This question was not answered by all interviewees.

Only 7% of the residents indicated their participation in cleaning the area of lead pollution, while the overwhelming majority 93% did not. This high negative response may be attributed to the fact that remediation and cleaning initiatives were actually conducted by specialized companies and qualified well-trained workers. Others responded by the fact that they participated through the public awareness and communication activities performed by the LIFE-Lead project, such as the clean-up campaign.

Male-Female KAP Statistical Variances

Statistical Variances for Males--

Male Experience as Workers in Industrial Facilities, Workshops, and/or Smelters--

Table 1.20 indicates the responses of interviewed males about their experience as workers in any industrial facility, workshop, or smelter in the study area.

Table 1.20: Male Experience as Workers in Industrial Facilities, Smelters, and/or Workshops

Males Working in Industrial Facilities, Smelters, and Workshops	Frequency	%
No	130	87%
Yes	20	13%
Totals	**150**	**100%**

Thirteen percent (13%) of the males interviewed declared they are working either in a smelter, industrial facility, or a workshop, while the majority (87%) stated they do not work in these places.

The importance of these responses implies that the increased male concern about lead pollution, as indicated by previous results, was not increased by the fact that the majority of males work in smelters or workshops. Hence, these motives are actually increased by other factors such as being concerned about their own health and their children's resulting from potential exposure to lead pollution located in their surroundings.

Smelters Worker Compliance with Wearing Safety Equipment--

The importance of this question is to identify the growing public awareness (males) about the health and safety precautions that may protect them from direct exposure to the health hazards resulting from handling metal wastes, including lead. Table 1.21 indicates responses obtained only from male workers in workshops, industrial facilities, or smelters.

Table 1.21: Male Commitment to Wear Safety Equipment at Work

Wearing Safety Equipment at Work	Frequency	%
Always	1	9
Sometimes protective mask only	1	9
No	16	82
Totals	**18**	**100%**

This question was not answered by two interviewees.

The following provides a summary of the male response to wearing safety equipment during work:

- 9% of the interviewed males stated that they "always" wear safety equipment at work in industrial sites.
- Another 9% of the male workers stated that they may sometimes use protective masks.
- The majority, represented in 82% of workers, denied wearing any preventive uniforms or equipment at work.

These results indicated that males who work in industrial professions might not care about applying the preventive or safety measures despite their awareness of the health hazards they may be exposed to while handling industrial materials or wastes. Their negligence of applying these preventive measures may be attributed to noncompliance of the employer, carelessness, or financial inability on the part of the worker.

This result is further enhanced by Table 1.22, which indicates residents (males and females) recognition of hazards resulting from exposure to lead in both the pre and post-KAP surveys.

Table 1.22: Comparing Pre and Post-KAP Survey Results
Recognition of Lead Pollution Dangers

Recognition of Lead Pollution Dangers	Post-KAP Survey Results		Pre-KAP Survey Results	
	Frequency	%	Frequency	%
Highly dangerous	300	100	266	85.3
Dangerous to some extent	-	-	45	14.4
Not dangerous	-	-	1	0.3

In the pre-KAP survey, those interviewed indicated their knowledge of significant existing risks from exposure to lead pollution. Hence, by adding the results of the "highly dangerous" and "dangerous to some extent" items, then 99.4% of those interviewed have indicated their recognition of the dangers of lead pollution.

- 85.3% of the residents, who know that the problem exists, believe that the lead pollution problem is highly dangerous in the pre-KAP.
- 14.4% indicated that the problem is "dangerous to some extent" in the pre-KAP.
- 0.3% indicated that the problem is "not dangerous" in the pre-KAP.
- Meanwhile, in the post-KAP survey, 100% of those interviewed indicated that the lead pollution problem is highly dangerous.

Male Awareness of Requesting Clean Food Utensils before Cooking--

Since this survey was not only limited to identifying the levels of knowledge and attitudes but also extends to the practice level, there was a need to identify male change in practices, which reflects their growing awareness of hazards of exposure to lead pollution. To test these changes in an indirect way, males were asked whether they request washing or cleaning of utensils before cooking. Table 1.23 provides their responses to this question.

Table 1.23: Males Requesting the Cleaning of Utensils Before Cooking

Request Cleaning of Utensils	Frequency	%
Always	133	88
Did not respond	9	6
Sometimes	7	5
No	1	1
Totals	**150**	**100**

The following provides a summary of the male response to requesting the cleaning of utensils before cooking:

- 88% of the males interviewed confirmed that they request the cleaning of utensils before cooking.
- 5% confirmed that they make this request sometimes.
- As few as 1% of males confirmed they do not extend that request.

It is evident that the levels of knowledge, attitude, and practice are highly interrelated based on the male response to requesting the cleaning of utensils before cooking.

Statistical Variances for Females--

Female Knowledge of the Availability and Type of Foods that Offer Protection from Lead Pollution--

Females were asked to identify available food or edibles that may help in protecting their family against lead pollution. Their responses are listed in Table 1.24.

Table 1.24: Female Knowledge of the Availability of Food and Edibles that Offer Protection from Lead Pollution

Knowledge of Availability of Food that Offers Protection from Lead Pollution	Frequency	%
Yes	69	64
No	54	36
Totals	**150**	**100**

The following provides a summary of the female knowledge of the availability of food that offers protection from lead pollution:

- 64% of the females confirmed their knowledge of the availability of foods that offer protection.
- 36% of the females stated that these foods do not exist.

This acceptable percentage (64%) indicated a high degree of female awareness and knowledge that healthy nutrition helps provide protection from lead pollution.

Females were asked to identify the types of food that helps provide protection from lead pollution. Their responses are provided in Table 1.25.

Table 1.25: Female Knowledge of Food Types that Provide Protection from Lead Pollution

Food Types	Frequency	%
Calcium-rich food	83	39
Iron-rich food	66	31
Vitamin C-rich food	45	21
Zinc-rich food	18	9
Totals	**212**	**100**

The total number of responses exceeds the number of interviewees due to accepting more than one response.

The following provides a summary of the female response to the types of food that helps provide protection from lead pollution:

- Calcium-rich food constituted 39% of responses.
- Iron-rich food constituted 31%.
- Food types rich in vitamin C constituted 21%.
- Zinc-rich food constituted 9%.

Female Knowledge of the Hazards Resulting From Applying Kohl (Local Eyeliner) on Children's Eyes--

Kohl is a local eyeliner that contains lead and constitutes a chronic threat if applied on children's eyes. Hence, it was necessary to ask females this question in the post-KAP survey questionnaire in order to measure any change or improvement in female knowledge

and/or practices. Table 1.26 provides a comparison between relevant responses in both the pre and post-KAP surveys.

Table 1.26: Comparing Pre and Post-KAP Survey Results
Hazards of Applying Kohl (Local Eyeliner) on Children

Hazards of Applying Kohl on Children	Post-KAP Survey		Pre-KAP Survey		Statistical Variance
	Freq.	%	Freq.	%	
Do not use kohl	137	92	127	73	19+
Kohl does not pose threat	12	8	35	20	-12
Do not know	1	1	5	3	-2
Kohl poses threat	-	-	7	4	-4
Totals	**150**	**100**	**174**	**100**	

On comparing the pre and post-KAP survey results, the following is indicated:

- During the period between the pre and post-KAP surveys, the number of females who believed that kohl with lead content does not constitute a threat on children has decreased from 20% to 8%, indicating a statistical variance of (–12).

- The number of females who did not know that kohl with lead content constitutes a threat on their children has decreased during the same period from 3% in pre-KAP survey to 1% in post-KAP survey, indicating a statistical variance of (–2). This indicates an increase in the number of females who recognize the dangers of kohl on the children has increased.

- The number of females who do not apply kohl with lead content for their children has significantly increased from 73% in the pre-KAP survey to 91% in the post- KAP survey, indicating a statistical variance of (+18).

Female Practice/Behavioral Changes--

<u>Female Washing Vegetables Habits before Cooking</u>--

Females were asked about their habits of washing vegetables before cooking. Their responses are listed in Table 1.27.

Table 1.27: Comparing Pre and Post-KAP Survey Results for Washing Vegetables before Cooking

Washing Vegetables Before Cooking	Post-KAP Survey Results		Pre-KAP Survey Results	
	F	%	F	%
Always	140	93	106	95.5
Sometimes	7	5	3	2.7
No	3	2	2	1.8
Totals	**150**	**100**	**111**	**100**

The following provides a summary of the female habits pertaining to the washing of vegetables prior to cooking:

- 93% of interviewed females indicated that they “always” wash vegetables before cooking, while 5% indicated that they do this “sometimes”, compared to 95.5% and 2.7% respectively in the pre-KAP survey.

- Only 2% of females stated that they do not wash vegetables prior to cooking, which remains the same percentage of females who gave the same response in the pre-KAP survey.

These results indicated that the overwhelming majority of females have a high awareness level on the necessity of cleaning and washing vegetables before cooking in both pre and post-KAP surveys.

Female Use of Cleaning Mops--

In order to identify the female behavioral changes regarding their habit of selecting the best and proper cleaning methods and types of mops used in cleaning their houses, windows, and balconies, they were asked to respond to the types of mops used. The results are provided in Table 1.28.

Table 1.28: Types of Mops Used by Females for Indoor Cleaning

Types of Mops Used	Post-KAP Survey		Pre-KAP Survey		Statistical Variances
	Frequency	%	Frequency	%	
Wet mops	92	61	47	27	+34
Dry mops	22	15	124	71	-56
Any	36	24	4	3	+21
Totals	**150**	**100**	**175**	**100**	

The following provides a summary of the female practice for cleaning inside their homes:

- 61% of the interviewed females confirmed using wet mops in cleaning floors, windows, and balconies, compared to 27% who gave the same response in the pre-KAP survey. This remarkable variance indicates that females have highly benefited from the LIFE-Lead awareness campaigns and communication activities.

- 15% of the females confirmed their use of dry mops in cleaning in the post KAP survey, compared to 71% in the pre-KAP survey. This positive drop during the period indicates that females have mostly abandoned the habit of using dry mops in cleaning their homes, since lead and other metal pollutants accumulate without being removed.

- 24% of the females claimed that there is no difference in using either dry or wet mops, compared to 3% only who gave the same response in the pre-KAP survey.

This negative result indicates that a high percentage of females are confused between using wet and dry mops. However, the risk of this result is reduced as we identify below how females handle the used mop after cleaning.

Female Habits of Handling Used Mops after Cleaning--

The way of handling the cleaning mop after use helps in identifying the level of disposal of lead pollutants. Female responses to how they handle cleaning mops after use are listed in Table 1.29.

Table 1.29: Comparing Pre and Post-KAP Survey Results for Disposal of Cleaning Mops After Use

Disposal of Cleaning Mops After Use	Post-KAP Survey		Pre-KAP Survey		Statistical Variances
	Frequency	%	Frequency	%	
Wash it	137	91	97	59	+32
Reuse it as is	9	6	27	16	-10
Shake it	4	3	41	25	-22
Totals	**150**	**100**	**165**	**100**	

The following provides a summary of methods used by females to dispose of cleaning mops after use:

- 91% of the females stated that they wash the mop after cleaning, compared to 59% who did the same in the pre-KAP survey, indicating a positive statistical variance of (+32). This result indicates an increase in positive female practices during the period between pre and post-KAP surveys.

- 3% of females stated that they clean the used mop or cloth by shaking it compared to 5% as stated in the pre-KAP survey. This result indicates a drop in applying this negative practice.

- 6% of the females confirmed that they reuse the cleaning mop or cloth as it is, compared to 16% in the pre-KAP survey.

Female Methods of Cleaning Carpets and Rugs--

In order to assess female and housewiife practices, they were asked how they cleaned carpets and rugs. Their responses are listed in Table 1.30.

Table 1.30: Cleaning Carpets and Rugs

Methods of Cleaning Carpets and Rugs	Frequency	%
In the balcony or on the staircase	62	40
Use vacuum cleaner	44	30
Lightly wetted then brushed	44	30
Totals	**150**	**100**

The following provides a summary of the female method of cleaning carpets and rugs:

- 40% of the females indicated that they either shake carpets and rugs from the balcony or on the staircase, which is a negative practice that does not help in the disposal of lead particulate.

- 30% of the females indicated that they use the vacuum cleaner.

- 30% stated that they slightly wet and brush carpets and rugs, which is a positive practice that constitutes 60% of total interviewed females.

Female Habits of Applying Kohl on their Children--

Females were asked about their habits of applying Kohl (local eyeliner with lead content) on children. Their responses are listed in Table 1.3.

Table 1.31: Comparing Pre and Post-KAP Survey Results
Mothers Habits of Applying Kohl (Local Eyeliner) on their Children

Applying Kohl on children	Post-KAP Survey Results		Pre-KAP-Survey Results		Statistical Variances
	Frequency	%	Frequency	%	
Do not apply kohl	136	91	127	72	+19
Sometimes	11	7	15	9	-2
Always	3	2	33	19	-17
Totals	**150**	**100**	**175**	**100**	

The following provides a summary of the female habit of applying Kohl eyeliner on children:

- 91% of the females confirmed that they do not apply kohl on their children's eyes, compared to 72% who gave the same response in the pre-KAP survey.

- 2% of the females confirmed that they "always" apply kohl on their children's eyes. The pre-KAP survey indicated that 19% of the females applied kohl permanently. This was reduced to 2% in the post-KAP.

- 7% stated that they apply kohl sometimes, compared to 9% in the pre-KAP survey.

It is noteworthy that the acceptable increase of female positive practices clearly reflects their improved awareness levels during the period between the two surveys, which is attributed to LIFE-Lead communication and awareness campaigns.

SECTION 2.0: RESULTS OF THE POST-KAP SURVEY FOR STAKEHOLDERS

Comparative Pre and Post-KAP Survey Samples

According to the LIFE-Lead Communication Strategy, stakeholders and influential community leaders were defined as a secondary target groups to be used to reach the Primary Target Groups with the goal of mobilizing the local community to support and sustain the LIFE-Lead remediation activities. LIFE-Lead implemented an on going capacity building program to provide stakeholders with information related to environmental problems and lead pollution. In addition, the project provided them with communication tools and messages to achieve the following objectives:

- Ensure their participation and support of project activities during all stages of the remediation process and sustain project technical and communication achievements in the future.

- Develop and implement policies and decisions that help improve environmental health and the quality of living in the East Shoubra El Kheima District.

- Reach the Primary Target Groups and encourage them to protect themselves and their families from lead pollution hazards through participation in project remediation activities.

In the post-KAP survey, the selected sample of stakeholders consisted of 50 individuals compared to 72 in the pre-KAP survey. The post-KAP sample represented organizations and departments that collaborated with the LIFE-Lead project. Tables 2.1 and 2.2 present a comparison between the pre and post-KAP survey samples.

Table 2.1: Comparing Pre and Post-KAP Survey Results
Classification of Survey Samples

Sample Classification		Post KAP Survey	Pre KAP Survey
		%	%
Gender	Males	66	76.4
	Females	43	23.6
Age	20-30	16	19.4
	30-40	24	47.2
	>40	60	33.4
Profession	Government employee	80	83
	Private enterprise	20	17
Education	Elementary	2	1.4
	Intermediate	14	38.9
	High	84	59.7

Table 2.2: Comparing Pre and Post-KAP Survey Results
Fields of Stakeholders Specialization and Professions

Stakeholders Specialization and Profession	Post KAP Survey	Pre KAP Survey
Schools and Educational Department	12	15
East Shoubra El Kheima District	10	20
Library	4	-
Local Media and Nile Media Center	6	-
Medical Center	5	8
Culture Palace	4	-
Imams and Priests	6	7
NGOs	3	11
Youth Centers and Clubs	-	10
Smelters Owners	-	1
Totals	**50**	**72**

Assessment of Stakeholder Knowledge and Attitudes Regarding the Lead Pollution Problem in Shoubra El Kheima

Stakeholder Knowledge of Persistent Environmental Problems in the Study Area--

Stakeholders were asked if they believe that other environmental problems still exist in the study area. Their responses are listed in Table 2.3.

Table 2.3: Stakeholder Perception about the Persistence of Environmental Problems in the Study Area

Persistence of Environmental Problems	Frequency	%
Yes	50	100
Totals	**50**	**100**

Similar to their responses in the pre-KAP survey, all interviewed stakeholders reconfirmed unanimously that the study area is still suffering from environmental problems. This proved that the bulk of environmental problems persisting in the study area were not limited to the lead pollution problems, but other problems were also cited in this survey.

Stakeholder Knowledge of the Types of Existing Environmental Problems--

Stakeholders were asked to identify persistent environmental problems in the study area. Their responses are listed in Table 2.4.

Table 2.4: Stakeholder Evaluation of the Type of Environmental Problems in the Study Area

Types of Environmental Problems	Frequency	%
All types of pollution	45	35
Solid wastes	43	34
Noise	21	17
Wastewater problems	10	8
Lead pollution	5	4
Misuse of chemicals	3	2
Totals	**127**	**100**

In the pre and post-KAP surveys, the total number of responses exceeds the number of interviewees due to accepting more than one response.

The following provides a summary of the stakeholder's identification of the types of environmental problems in the study area:

- 35% of the stakeholders confirmed that the study area is still suffering from various types of pollution problems (unidentified). They indicated that they see pollution surrounding them from all sides, coming from various sources, and taking several forms.

- 34% of the stakeholders considered the accumulation and unsafe disposal of solid waste as a secondary pollution phenomenon in the study area.

- 17% of the stakeholders classified noise as a form of pollution. That indicates that there is a level of awareness with various types of pollution, including noise pollution.

- 8% of the stakeholders indicated that the wastewater services are among the bulk of environmental problems.

- Only 4% of the stakeholders considered that lead pollution is still an environmental problem. This important result is a reflection of the public opinion that there has

been a decline in the lead pollution problem among other environmental problems in the study area.

Stakeholder Concerns Pertaining to Environmental Problems--

In the pre-KAP survey, stakeholders were asked about their level of concern regarding environmental problems. Their responses indicated that more than half of those interviewed had limited concern or recognition of the volume of environmental problems. Results of the pre-KAP survey underlined the necessity of upgrading the stakeholder awareness of environmental problems and outlining their roles and responsibilities in community awareness campaigns.

In the post-KAP survey questionnaire, stakeholders were asked about their level of concern for environmental problems in the study area. Their responses are presented in Table 2.5.

Table 2.5: Comparing Pre and Post-KAP Survey Results
Assessment of Stakeholder Concerns Regarding Environmental Problems

Level of Concern	Post-KAP Survey		Pre-KAP Survey	
	Frequency	%	Frequency	%
Highly concerned	48	96	33	45.8
Concerned to some extent	2	4	39	54.2
Totals	**50**	**100**	**72**	**100**

Ninety-six percent (96%) of the stakeholders considered themselves highly concerned about environmental issues, while 4% considered themselves concerned to some extent. None of the stakeholders voiced no concern about environmental problems.

These results reflect that the overwhelming majority are currently concerned about environmental issues, which indicates a remarkable upgrade in their concern and attitudes toward environmental issues in general between the pre and post-KAP surveys.

Although only 45.8% of stakeholders in the pre-KAP survey have voiced concern for such issues, the post-KAP survey clearly indicated the growing concern of 96% of the stakeholders about environmental issues. This can be interpreted as a direct result of the LIFE-Lead environmental awareness and communication activities. This result is in line with the pre-KAP survey recommendations on the necessity to upgrade stakeholders' awareness of environmental problems and identify their roles in the community awareness campaigns.

Stakeholder Perception Regarding the Residents Level of Concern for Environmental Problems--

Stakeholders were asked about their views regarding the level of concern by the residents on environmental problems. Their responses are listed in Table 2.6.

Table 2.6: Comparing Pre and Post-KAP Survey Results
Stakeholder Views on Resident Concerns for Environmental Problems

Assessed Residents' Level of Concern for Environmental Problems	Post-KAP Survey		Pre-KAP Survey	
	Frequency	%	Frequency	%
Concerned to some extent	32	64	32	44.4
Highly concerned	16	32	15	20.9
Unconcerned	2	4	25	34.7
Totals	**50**	**100**	**72**	**100**

The following provides a summary of the stakeholder views on the concern of residents about environmental problems:

- 64% of the stakeholders considered that the residents were concerned about the environmental pollution problems to some extent, compared to 44.4% who gave the same response in the pre-KAP survey.

- 32% of the stakeholders considered that the residents were highly concerned about the environmental pollution problems, compared to 20.9% who gave the same response in the pre-KAP survey.

- 4% of the stakeholders considered that the residents were not concerned about those environmental problems, compared to 34.7% who gave the same view in the pre-KAP survey.

These variances indicate that the stakeholders believe that the residents have acquired a growing concern about environmental problems in the study area during the period between the pre and post-KAP surveys.

Stakeholder Prior Knowledge of Lead Pollution Hazards before LIFE-Lead--

Stakeholders were asked about their knowledge of the lead pollution hazards prior to the activities conducted by LIFE-Lead. Their responses are listed in Table 2.7.

Table 2.7: Comparing Pre and Post-KAP Survey Results
Stakeholder Prior Knowledge of Lead Pollution Hazards before the LIFE-Lead Project

Stakeholders' Prior Knowledge	Post-KAP Survey		Pre-KAP Survey	
	Frequency	%	Frequency	%
Yes	45	100	69	97.2
No	-	-	1	1.4
Do not know	-	-	1	1.4
Totals	**45**	**100**	**72**	**100**

This question was not answered by five interviewees.

In the post-KAP survey, all interviewed stakeholders have unanimously confirmed their knowledge of the hazards of the pollution problem, compared to 97.2% of stakeholders in the pre-KAP survey. By comparing the results of both surveys, it is found that 1.4% believed that it was not hazardous, and another 1.4% did not know whether this problem was hazardous or not. The post-KAP survey results confirm that stakeholders are fully convinced that the lead pollution is a hazardous environmental problem.

Stakeholder Knowledge of the Hazardous Health Impacts of the Lead Pollution Problem--

Stakeholders were asked about their knowledge regarding the severe hazardous impacts of the lead pollution problem. Their responses are listed in Table 2.8.

Table 2.8: Comparing Pre and Post-KAP Survey Results
Stakeholder Knowledge Regarding the Hazardous Health Impacts of the Lead Pollution Problem

Stakeholder Knowledge of the Harmful Health Impacts of the Lead Pollution Problem	Post-KAP Survey		Pre-KAP Survey	
	Frequency	%	Frequency	%
Respiratory system	41	30	46	37.4
Children's intelligence growth	30	22	18	14.6
Kidneys and liver	19	14	2	1.6
High blood pressure	17	12	9	7.3
Pregnant mothers and women at menopause age	15	11	8	6.5
Growth especially for children	15	11	19	15.4
Other health hazards including all the above	-	-	21	17.2
Totals	**137**	**100**	**123**	**100**

In the pre and post-KAP surveys, the total number of responses exceeds the number of interviewees due to accepting more than one response.

The following provides a summary of stakeholder knowledge regarding the hazardous health impact of the lead pollution problem:

- 30% of the stakeholders indicated that the pollution resulting from lead smelters causes harmful effects on the respiratory system, compared to 37.7% who gave the same response in the pre-KAP survey.

- 22% of the stakeholders indicated that lead has a hazardous effect on children's intelligence, compared to 14.6% who had the same view in the pre-KAP survey.

- 14% of the stakeholders stated that lead pollution resulting from the lead smelters has a harmful impact on the kidneys and the liver, compared to 1.6% who had the same response in the pre-KAP survey. These results indicate that there is an increase in the level of awareness of the stakeholders regarding the different harmful impacts on the health.

- 12% of the stakeholders confirmed that the lead pollution problem caused high blood pressure, compared to 7.3% who gave the same response in the pre-KAP survey.

- 11% of the stakeholders indicated that the lead pollution problem had harmful impacts on pregnant women and females at the menopause age, compared to 6.5% who had the same answer in the pre-KAP survey.

- 11% of the stakeholders indicated that the lead pollution problem had harmful impacts on children's growth, compared to 15.4% who had the same view in the pre-KAP survey. This indicates that there is a decline in stakeholder awareness with this type of impact.

Stakeholder Self-Confidence in their Capacity to Raise the Residents' Awareness of Environmental Issues--

In order to determine stakeholder self confidence in their future role in raising the residents concern and awareness about environmental issues, they were asked the questions listed in Table 2.9.

Table 2.9: Comparing Pre and Post-KAP Survey Results
Stakeholder Self-Confidence in their Capacity to Upgrade Community Concerns for Environmental Issues

Stakeholder Self-Confidence in their Capacity to Upgrade Community Residents Level of Concern for Environmental Problems	Post-KAP Survey		Pre-KAP Survey	
	Frequency	%	Frequency	%
Fully-efficient	36	72	37	51.4
Efficient to some extent	14	28	30	41.7
Inefficient	-	-	5	6.9
Totals	**50**	**100**	**72**	**100**

Seventy-two percent (72%) of the stakeholders considered themselves fully efficient to participate and assist in upgrading environmental awareness in the study area, compared to 51.4% who had the same self-confidence in the pre-KAP survey. This increase reflects an elevated stakeholder self-confidence, which may be attributed to the LIFE-Lead capacity building and communication programs.

Stakeholder Knowledge of the Parties that Collaborated in Solving the Lead Pollution Problem in the Study Area--

Stakeholders were asked about their knowledge of the parties that collaborated in solving the lead pollution problem in the study area. Their responses are listed in Table 2.10.

Table 2.10: Stakeholder Knowledge of Parties Involved in Solving the Problem

Parties that Helped in Solving Pollution Problem	Frequency	%
LIFE-Lead Project	35	32
LIFE-Lead Project in collaboration with District Authorities	24	22
LIFE-Lead Project in collaboration with EEEA	23	21
LIFE-Lead Project in collaboration with the Governorate	13	12
LIFE-Lead Project in collaboration with USAID	10	9
LIFE-Lead Project in collaboration with the Local Council	5	4
Totals	**110**	**100**

LIFE-Lead came on top of the list of agencies involved in solving the lead pollution problem (according to 32% of respondents), followed by the District Officials (22%), the Ministry of State for Environmental Affairs (21%), the Governorate of Qalyoubia (12%), USAID (9%), and the Local Council (4%). It is noteworthy that all these agencies have worked in coordination with the LIFE-Lead project, and thereby, the project is sharing in all of these percentages.

Stakeholder Evaluation of the Role of the LIFE-Lead Project in Solving the Lead Pollution Problem--

Stakeholders were asked about their perception of the role performed by the LIFE-Lead Project in solving the lead pollution problem in the area. Their responses are provided in Table 2.11.

Table 2.11: Stakeholder Evaluation of the LIFE-Lead Project Role in Solving Lead Pollution Problems in the Study Area

Evaluation of LIFE-Lead Project Role	Frequency	%
Project has entirely solved the lead pollution problem in the area	28	56
Project has partially solved the lead pollution problem in the area	22	44
Totals	**50**	**100**

The following provides a summary of the stakeholders' evaluation of the role of LIFE-Lead in solving lead pollution problems in the study area:

- 56% of the stakeholders affirmed that the LIFE-Lead project has entirely solved the lead pollution problem in the study area.

- 44% of the stakeholders perceived that the LIFE-Lead project has partially solved the problem. They believed that pollution levels are still high in the streets surrounding smelter sites.

Stakeholder Self Confidence about their Future Role to Sustain Project Accomplishments--

The stakeholders were asked about their willingness to play a future role in sustaining the LIFE-Lead remediation accomplishments. Their responses are provided in Table 2.12.

Table 2.12: Stakeholder Self Confidence in their Role to Sustain the LIFE-Lead Remediation Accomplishments

Perceived Role in Sustaining the Remediation Accomplishments	Frequency	%
Yes	50	50
Totals	**50**	**100**

All interviewed stakeholders have unanimously confirmed their full confidence in the major role expected from them to sustain the LIFE-Lead remediation accomplishments in the study area.

Stakeholder Prospects for Their Future Role in Sustaining Project Accomplishments--

Table 2.13 indicates the relationship between the stakeholder professions and their prospective for their future role to sustain the LIFE-Lead remediation accomplishments.

Table 2.13: Relationship between Stakeholder Professions and Their Prospective for Their Future Role to Sustain Project Accomplishments

Stakeholders	Perceived Role in lead pollution abatement		Method					Totals
	Yes	No	Awareness Through My Position	Cooperate With Smelters Owners	Intensive Environ. Inspection	Encourage Students To Participate	Develop and Teach Environ. Curricula	
Schools	12		12			11	10	33
NGOs	3		2			1		3
Library	4		4			1		5
Local media	6		6					
Medical center	5		5					
Culture palace	4		4				1	1
District Authority	10		6	9	9			24
Religious leaders	6		6			2	3	11
Totals	**50**		**45**	**9**	**9**	**17**	**15**	**90**
%			**50**	**9**	**9**	**17**	**15**	**100**

The majority of the stakeholders interviewed indicated that they had more than one role to sustain the LIFE-Lead accomplishments. They listed their future contributions as follows:

- 50% by proceeding with the public awareness efforts among community residents.
- 17% by encouraging students to participate.
- 15% by teaching environmental education curricula and activities developed by the LIFE-Lead project in collaboration with teachers.
- 9% by collaborating with smelter owners.
- 9% by intensifying environmental inspection processes.

These results indicated the interrelationship binding stakeholder professions and their perception for their future roles to sustain the LIFE-Lead remediation accomplishments. For example, the role of the majority of the District Officials can be seen in the intensive environmental inspections conducted and then their collaboration with the smelter owners. Also, teachers roles would be perceived as encouraging the students and in proceeding with teaching the environmental curricula developed in collaboration with the LIFE-Lead project team.

Stakeholder Practices Regarding the Lead Pollution Problem in Shoubra El Kheima

Stakeholder' Assistance in Solving the Lead Pollution Problem--

In order to detect any positive changes in their practices, the interviewed stakeholders were asked about their actual participation to support the technical and communication initiatives. Their responses are listed in Table 2.14.

Table 2.14: Stakeholder Participation in the Technical and Communication Initiatives

Stakeholder Roles	Post-KAP Survey	
	Frequency	%
Yes	44	88
No	6	12
To Some Extent		
Totals	**50**	**100**

The following provides a summary of the stakeholder identification of their role in solving the lead pollution problem:

- 86% of the stakeholders confirmed that they have played a role in supporting project activities in the study area.
- 12% stated that they did not play any role.
- 2% indicated that they have a role to some extent in solving the problem.

In the pre-KAP survey, 98% of the stakeholders voiced their willingness to participate in solving the lead pollution problems in Shoubra El Kheima.

Stakeholders Actual Participation In Light of Their Professions--

The stakeholders were asked about the roles they played with the LIFE-Lead project to overcome the lead pollution problem. Their responses are provided in Table 2.15.

Table 2.15: Relationship between Stakeholder Professions and the Target Lead Abatement Interventions

Stakeholders	Yes	No	Nature of Role										Totals
			Spread Awareness Through My position		Cooperate with Smelters Owners		Intensive Environment Inspection Process		Encourage School Students to Participate		Develop and Teach Environment Curricula		
			F	%	F	%	F	%	F	%	F	%	
Schools	11	1	11	38					9	31	9	31	29
NGOs	2	1	1	50					1	50			2
Library	4		4	100									4
Mass Media	4	2	5	57					2	29	1	14	7
Medical Center	4	1	4	67					1	16	1	16	6
Culture Palace	4		4	100									4
District	8	2	55	31	7	4	4	25					16
Imams and Priests	6		6	60					2	20	2	20	10
Totals	**43**	**7**	**39**	**48%**	**7**	**8.7%**	**7**	**8.7%**	**15**	**18.6%**	**13**	**16%**	**81**

Education officials and employees were the most active participants among all stakeholders. Their major roles were detected in the awareness and communication initiatives (38%), student encouragement (30%), and then their collaboration with the LIFE-Lead team in developing and teaching environmental curricula (30%).

The District officials came next in terms of participation, namely in their collaboration with smelter owners (44%) and participation in the awareness-raising activities (31%), followed by their intensive environmental inspections (25%).

The third highest participation was that of the religious leaders, whose activities focused on awareness upgrading initiatives. These were performed during Friday prayers in mosques and sermons in churches (60%). Also, the religious leaders had a role in encouraging student participation (20%) and in teaching environmental curricula in churches (20%).

Means of Stakeholder Participation in Implemented LIFE-Lead Communication Activities--

Stakeholders were asked about their participation in the LIFE-Lead communication activities. Their responses are listed in Table 2.16.

Table 2.16: Means of Stakeholder Participation in Implemented LIFE-Lead Communication Activities

Means of Participation	Always		Sometimes		No		Totals
	F	%	F	%	F	%	
Benefit from LIFE-Lead publications	35	70	13	26	2	4	50
Public seminars organized by LIFE-Lead	29	58	19	38	2	4	50
Meetings held by LIFE-Lead	19	38	22	44	9	18	50
Training courses organized by LIFE-Lead	15	30	13	26	22	44	50
Total	**98**	**49%**	**67**	**34%**	**35**	**17%**	**200**

The following provides a summary of the stakeholder means of participating in the LIFE-Lead communication activities:

- 70% of the stakeholders confirmed they have always used LIFE-Lead publications, and 26% indicated that they have used them sometimes, while 4% said they have never used them.

- 58% of the stakeholders shared in the public forums and seminars organized by the LIFE-Lead project, 38% confirmed they have attended these forums sometimes, while 4% said they never did.

- 44% of the stakeholders confirmed they have sometimes attended LIFE-Lead project meetings, and 38% stated they have always attended these meetings, while 18% confirmed they never did.

- 44% of stakeholders confirmed the have never participated in the LIFE-Lead training sessions, and 30% confirmed they always attended, while 26% stated that they attended these sessions sometimes.

These results clearly indicated that the stakeholders were keen to participate in the majority of the LIFE-Lead communication initiatives either through using LIFE-Lead publications and communication tools in their public awareness activities or attending the LIFE-Lead organized meetings, seminars, and training sessions.

CONCLUSIONS AND RECOMMENDATIONS

This section presents the major findings of the KAP Study and its conclusions for the community residents and stakeholders. The section also presents recommendations for the sustainability of public awareness and community participation activities.

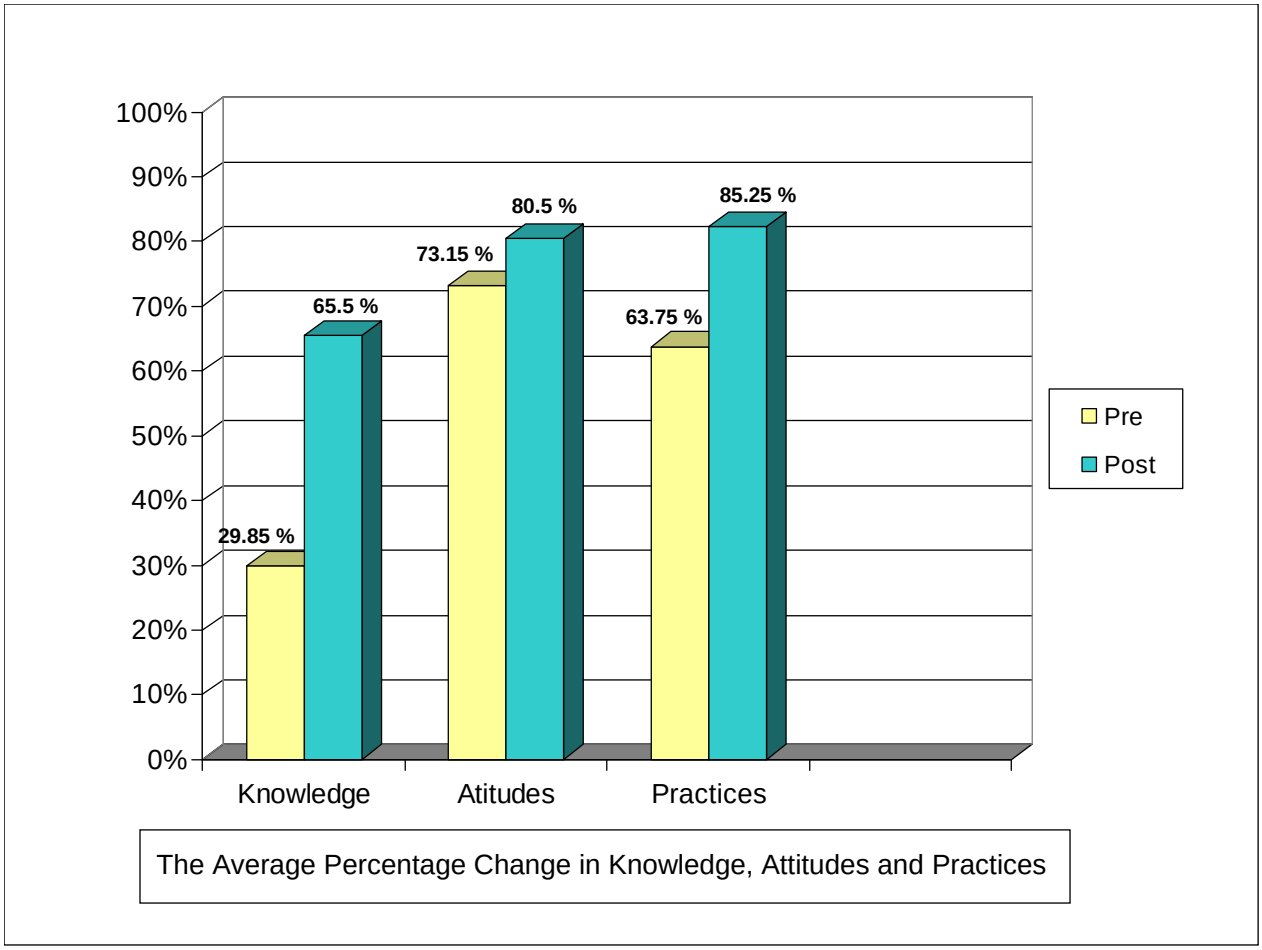
Conclusions

Residents--

A statistical index was developed to compare the results of the pre and post-KAP surveys. The index reflects the variables of the knowledge, attitudes, and practices from both surveys. The following are examples of the variables:

- Knowledge variables include the following:
  - Persistence of the lead pollution problem.
  - Controlling the lead pollution problem in the area.
  - Efforts of LIFE-Lead as a source of knowledge.
  - Dust, exhaust, and lead as sources of contamination of food.
  - Pollution and its hazards on children playing in the streets.
  - The extreme hazards of lead pollution.
  - The residents' awareness of smelters being one of the pollution sources in the area.
  - The residents' awareness of the health effects of lead pollution.
- Attitude variables include the following:
  - Attitudes supporting the transfer of smelters from the area.
  - Negative attitudes supporting keeping smelters in the area.
- Practices variables include the following:
  - Using kohl, especially on children.
  - Using the best methods for cleaning, such as using a wet cloth and washing the cleaning cloth after each use.
  - Good preparation of food, such as washing vegetables before cooking, washing utensils, etc.
  - Good nutrition.

The results shown in the following figure, "The Average Percentage Change in Knowledge, Attitudes, and Practices," reflect an increase in knowledge by 35.6%, in attitudes by 7.3%, and in practices by 21.5%.



The results show that the highest increase was in resident knowledge, followed by practices, and then attitudes. The highest increase in knowledge shows that residents interacted more with the awareness activities; either the ones conducted by LIFE-Lead or those performed by the local community organizations after being trained and technically assisted by the project. The results also show that the remediation efforts implemented by the project at the polluted sites were efficient means of raising community awareness.

The increase in practices reflects that the residents took positive actions to protect themselves and their environment from lead pollution due to their increased awareness of lead pollution problems and its health hazards. However, the change in the percentage of practices is lower than that of knowledge. That indicates that changes in practices are more difficult. An individual might be aware of the hazards of a certain practice, but remains governed by other factors that do not enable him/her to change their behavior. Such contradiction can be shown in the post-KAP survey. For example, smelter workers are aware of the necessity of using personal protective equipment. However, they do not use such equipment due to several reasons; either the equipment is not available, they cannot afford to buy it, the smelter owner does not provide it, or they perceive it as uncomfortable and would prevent them from working properly.

The results show that the least change in percentages was recorded in attitudes. In addition, the positive change in the resident's attitudes regarding the transfer of the smelters from their area was only minor. This might be due to economic reasons. The area residents are aware of the hazards caused by these smelters (as indicated in the results of the knowledge and practices sections), but have no other economic alternative since they risk being unemployed or jobless if the smelters are transferred.

The results of the study show that the efforts of public awareness and community participation programs conducted by the project were productive. The local community is now more aware of the sources of lead pollution in the area, its hazards, the remediation activities implemented by LIFE-Lead, and the outcomes of these activities. A satisfactory positive change in the local community practices to protect themselves and their families from the hazards of lead pollution was also reflected in the results as presented by the project in the awareness and community participation activities. However, the results indicated that the change in attitudes of the local community is still unsatisfactory. This was expected due to the many different and difficult factors that govern changes in attitudes.

Since the above mentioned index was developed for comparison, it does not include variables that were only addressed by the post-KAP survey, which demonstrated notable improvement in the knowledge, attitudes, and practices of the residents. Following are examples of the variables that were only included in the post-KAP:

- Knowledge of the sites remediated by LIFE-Lead, especially the smelters as constant sources of lead pollution. Most residents were aware of the remediation efforts taking place in their area due to both the public awareness initiatives and the remediation activities at the contaminated industrial sites.

- Knowledge of the population segments most affected by lead pollution and the health effects on children, women, and men. A reasonable percentage of the residents were aware of the special hazards of lead pollution on children. However, their level of awareness regarding the pregnant and breastfeeding mothers is unsatisfactory.

- Knowledge of nutrients that help protect against pollution hazards. Most women indicated that they are aware of the specific nutrients that protect against pollution hazards and were able to identify those nutrients.

- Participation in advising others and informing them of the pollution problem. Most residents indicated that they actively participate in advising others on environmental protection.

Stakeholders--

Unlike the residents, stakeholders were a Secondary Target Group for the project communication strategy. Project messages were communicated to them, but more importantly, and based on their influence on the local community, they were encouraged to mobilize the community to achieve the project communication objectives and to sustain the results of the remediation activities.

The stakeholders questioned for the post-KAP survey were chosen from the organizations that cooperated with LIFE-Lead, such as: the schools and the Education Department; Shoubra El Kheima Public Library; the local media and the local medical organizations, Bahteem Cultural Center, the religious leaders, the NGOs, the youth centers and clubs, and the smelter owners.

The post-KAP survey results indicate that all the stakeholders agree that there are still environmental problems persistent in the area. They rated these pollution problems as follows: all types of pollution, solid waste, noise pollution, sewage, lead pollution, and chemicals. The results also indicate that almost 96% of the sample is very concerned about the environmental problems compared to 46% in the pre-KAP survey, which is a healthy increase in percentage.

The results also indicate that the stakeholders have significantly changed their opinion about how much the community is concerned with environmental problems, and they are now more confident in their abilities to raise local community interest in environmental problems. The study results for the residents show that this opinion is reciprocated. The concrete results of project efforts and the participation of the stakeholders in these efforts has created mutual trust between the residents and the stakeholders. Public awareness and community participation activities have successfully communicated to the residents the results of the remediation efforts. The stakeholders are aware of the efforts made by LIFE-Lead to solve the lead pollution problem in the area, and of the governmental authorities that cooperated with it. It is now necessary that the concerned governmental bodies take all actions to sustain the results of the remediation works and continue other environmental protection efforts in the area to build on this trust and employ it.

The stakeholders mostly believe that the lead pollution problem has been solved in the area. However, a high percentage indicates that it has been partly solved. This is probably because the awareness activities emphasized the need to keep protecting oneself and family from the hazards of lead pollution that is still present in the dust and streets even though the sources have been shut down and remediated. It is therefore necessary that the East Shoubra El Kheima District take actions to pave the streets around the remediated sites, which will help control the residual dust and prove to the stakeholders and residents that environmental protection measures are taken to completely solve the pollution problem even after the project has phased-out.

The entire research sample agrees that they have a role in sustaining the remediation efforts, which is a great accomplishment. Throughout its duration, LIFE-Lead has engaged a good number of the local community stakeholders in its activities and has mobilized them to communicate with the residents and influence them. The stakeholders have noted how their positive participation reached the residents and how they were able to make a difference. It is necessary that the concerned governmental bodies continue to mobilize the stakeholders, since they have gained credibility with the residents and are quite confident in their abilities and roles.

Recommendations

LIFE-Lead efforts to raise community awareness, engage the community in participation activities, and develop mutual trust between governmental bodies and the community have proven to be successful. The knowledge, attitudes, and practices of the community residents and stakeholders have significantly developed and are directed towards environmental protection. Both groups have confidence that they can make a change.

Such efforts require time and resources, and in the case of LIFE-Lead, this was evident in both the remediation and community participation activities. It is now necessary to take specific actions to sustain project accomplishments. This will help maintain the positive changes in knowledge, attitudes, and practices, and will be easy to implement given the future plans of the governorate and the governmental bodies to continue environmental protection activities in the area. These future plans include actions that require public support, such as smelter relocation and remediation activities.

LIFE-Lead recommends that the Governorate of Qalyoubia, the East Shoubra El Kheima District, and EEAA cooperate to achieve the following, to sustain and build upon project community participation activities:

- Relocate the polluting industries outside the residential areas. The local community needs to see serious actions taken towards this transfer as soon as possible, so that a clear message is given that the previous efforts shall be maintained.

- Pave the streets surrounding the remediated sites to prove that the remediation and environmental protection efforts will not stop with the end of the project.

- Continue mobilizing the stakeholders in similar environmental efforts, to invest in the mutual trust they have with the local community and benefit from their abilities and qualifications in communication and environmental awareness.

- Conduct a further study to investigate the attitudes against smelter relocation and whether this is caused by economic reasons.

- The educational authorities should continue conducting the environmental protection and awareness activities at the remediated schools and spread those alternatives to other schools of the area.

- The educational authorities should also continue using project education tools – Environmental Booklet and Supplementary Booklet – to continue educating students about the importance of environmental protection and the pollution hazards. This also helps raise the awareness of the whole community, since project experience proves that the children transfer their knowledge to their families.