

GEF-6 PROGRAM FRAMEWORK DOCUMENT (PFD)

TYPE OF TRUST FUND: GEF Trust Fund



PART I: PROGRAM IDENTIFICATION

| | | | |
|---|---|---------------------------|---------------|
| Program Title: | ENVIRONMENTAL HEALTH AND POLLUTION MANAGEMENT PROGRAM (EHPMP) IN AFRICA | | |
| Country(ies): | Africa (Ghana, Kenya, Senegal, Tanzania, Zambia and Regional) | GEF Program ID: | 9444 |
| Lead GEF Agency: | WB (select) (select) | GEF Agency Program ID: | N/A |
| Other GEF Agency(ies): | NA | Submission Date: | 10 April 2017 |
| Other Executing Partner(s): | Governments of participating countries | Program Duration (Months) | 60 |
| GEF Focal Area (s): | Chemicals and Wastes | Program Agency Fee (\$): | 3,798,165 |
| Integrated Approach Pilot | IAP-Cities <input type="checkbox"/> IAP-Commodities <input type="checkbox"/> IAP-Food Security <input type="checkbox"/> | | |
| Program Commitment Deadline: 31 July 2018 | | | |

A. FOCAL AREA STRATEGY FRAMEWORK AND OTHER PROGRAM STRATEGIES:

| Objectives/Programs | Expected Outcomes | Trust Fund | Amount (in \$) | |
|----------------------------|--|------------|-----------------------|--------------------|
| | | | GEF Program Financing | Co-financing |
| CHEM-2 Program 3 | Country capacity built to effectively phase out and reduce releases of POPs | GEFTF | 28,715,596 | 144,450,000 |
| CHEM-2 Program 4 | Country capacity built to effectively manage mercury pollution in priority sectors | GEFTF | 13,486,239 | 98,600,000 |
| Total program Costs | | | 42,201,835 | 243,050,000 |

B. INDICATIVE PROGRAM RESULTS FRAMEWORK

Program Objective: Reduce environmental health risks related to harmful chemicals and waste through strengthened institutional partnership and capacity in pollution management in targeted countries in Africa

| Program Components | Financing Type ¹ | Program Outcomes | Trust Fund | (in \$) | |
|---|-----------------------------|---|------------|-----------------------|--------------|
| | | | | GEF Program Financing | Co-financing |
| Component 1: Institutional Strengthening, Knowledge and Capacity Building | TA | Improved capacity to identify and address environmental health risks associated with harmful chemicals and waste, including POPs and mercury <i>Indicators and Targets*</i> : - Establishment of a Regional forum for monitoring and decision-making on use and trade of mercury and unsound processing of electronic waste; - Improved capacity for monitoring of mercury data (usage and trade) and ewaste; - Better inventory of mercury import data at country level; - Awareness among targeted mining communities about environmental health risks; - Inspection protocols developed and enforcement authorities equipped with monitoring equipment; - Training of inspection officers of participating countries. | GEFTF | 9,854,587 | 67,416,988 |
| Component 2: Policy Dialogue and Regulatory Enhancements | TA | Stakeholder engagement at national and regional levels and Environmental policies and regulations of participating countries strengthened <i>Indicators and Targets:</i> - Policy commitment and regulations developed for mercury reduction in ASGM; - Policy commitment and regulations developed for | GEFTF | 9,846,330 | 51,331,172 |

¹ Financing type can be either investment or technical assistance.

| | | | | | |
|--|-----|---|-------|------------|-------------|
| | | <p>improved management of urban and ewaste;</p> <ul style="list-style-type: none"> - Regional guidance developed on formalization of ASGM; - Regional guidance for ewaste management; - Sharing of knowledge of successful models through South-South exchanges; -Regional strategy/meetings undertaken and South-south exchanges that address common ASGM and e-waste and other chemicals management priorities. | | | |
| Component 3: Demonstrating Application of Technological Tools and Economic Approaches | INV | <p>Successful demonstration pilots for reduced environmental health risks due to POPs and mercury and establishing sustainable models that engage affected communities in targeted countries</p> <p><i>Indicators and Targets:</i></p> <ul style="list-style-type: none"> -Deployment of clean technologies which support phasedown of mercury usage - Private sector engagement in selected ewaste pilot project sites; - Reduction of UPOPs from open burning of solid waste from pilot sites. | GEFTF | 20,390,835 | 114,962,384 |
| Subtotal | | | GEFTF | 40,091,742 | 233,710,544 |
| Program Management Cost (PMC) | | | GEFTF | 2,110,093 | 9,339,456 |
| Total Program costs | | | GEFTF | 42,201,835 | 243,050,000 |

* Indicators and targets will be further developed and refined during preparation of the child projects

C. CO-FINANCING FOR THE PROGRAM BY SOURCE, BY NAME AND BY TYPE

| Sources of Co-financing | Name of Co-financier | Type of Co-financing | Amount (\$) |
|---------------------------|--|----------------------|--------------------|
| World Bank | IDA | Loan | 235,800,000 |
| World Bank | Extractive Industries Transparency Initiative (EITI) | Grant | 450,000 |
| World Bank | WB Development Grant Facility (DGF) | Grant | 5,000,000 |
| Recipient Government | Government of Tanzania | In-Kind | 300,000 |
| Recipient Government | Government of Ghana | In-Kind | 600,000 |
| Recipient Government | Government of Kenya | In-Kind | 300,000 |
| Recipient Government | Government of Zambia | In-Kind | 300,000 |
| Recipient Government | Government of Senegal | In-Kind | 300,000 |
| Total Co-financing | | | 243,050,000 |

D. GEF/LDCF/SCCF RESOURCES REQUESTED BY AGENCY, TRUST FUND, COUNTRY, FOCAL AREA AND PROGRAMMING OF FUNDS

| GEF Agency | Type of Trust Fund | Country/Regional/Global | Focal Area | Programming of Funds | (in \$) | | |
|------------------------------|--------------------|-------------------------|---------------|----------------------|--------------------|------------------|-------------------|
| | | | | | GEF Program Amount | Agency Fee* | Total |
| WBG | GEF TF | Zambia | Chemicals and | POPS | 8,256,881 | 743,119 | 9,000,000 |
| WBG | GEFTF | Tanzania | Chemicals and | Mercury | 7,339,450 | 660,550 | 8,000,000 |
| WBG | GEFTF | Ghana | Chemicals and | POPS | 4,587,156 | 412,844 | 5,000,000 |
| WBG | GEFTF | Ghana | Chemicals and | Mercury | 4,128,440 | 371,560 | 4,500,000 |
| WBG | GEFTF | Kenya | Chemicals and | POPS | 8,073,395 | 726,605 | 8,800,000 |
| WBG | GEFTF | Senegal | Chemicals and | POPS | 5,504,587 | 495,413 | 6,000,000 |
| WBG | GEFTF | Regional | Chemicals and | POPS | 2,293,578 | 206,422 | 2,500,000 |
| WBG | GEFTF | Regional | Chemicals and | Mercury | 2,018,349 | 181,651 | 2,200,000 |
| Total Grant Resources | | | | | 42,201,835 | 3,798,165 | 46,000,000 |

* Please indicate fees related to this Program. Refer to the [Fee Policy for GEF Partner Agencies](#).

E. PROGRAM'S TARGET CONTRIBUTIONS TO GLOBAL ENVIRONMENTAL BENEFITS

| Corporate Results | Replenishment Targets | Indicative Program Targets |
|---|--|--|
| 1. Maintain globally significant biodiversity and the ecosystem goods and services that it provides to society | Improved management of landscapes and seascapes covering 300 million hectares | <i>hectares</i> |
| 2. Sustainable land management in production systems (agriculture, rangelands, and forest landscapes) | 120 million hectares under sustainable land management | <i>hectares</i> |
| 3. Promotion of collective management of transboundary water systems and implementation of the full range of policy, legal, and institutional reforms and investments contributing to sustainable use and maintenance of ecosystem services | Water-food-ecosystems security and conjunctive management of surface and groundwater in at least 10 freshwater basins; | <i>number of freshwater basins</i> |
| | 20% of globally over-exploited fisheries (by volume) moved to more sustainable levels | <i>percent of fisheries, by volume</i> |
| 4. Support to transformational shifts towards a low-emission and resilient development path | 750 million tons of CO _{2e} mitigated (include both direct and indirect) | <i>metric tons</i> |
| 5. Increase in phase-out, disposal and reduction of releases of POPs, ODS, mercury and other chemicals of global concern | Disposal of 80,000 tons of POPs (PCB, obsolete pesticides) | * |
| | Reduction of 1000 tons of Mercury | <i>75 metric tons</i> |
| | Phase-out of 303.44 tons of ODP (HCFC) | <i>NA ODP tons</i> |
| 6. Enhance capacity of countries to implement MEAs (multilateral environmental agreements) and mainstream into national and sub-national policy, planning financial and legal frameworks | Development and sectoral planning frameworks integrate measurable targets drawn from the MEAs in at least 10 countries | <i>Number of Countries: 5</i> |
| | Functional environmental information systems are established to support decision-making in at least 10 countries | <i>Number of Countries: 5</i> |

* The Program directly contributes to Corporate Result #5 *Increase in phase-out, disposal and reduction of releases of POPs, ODS, mercury and other chemicals of global concern*. In line with GEF-6 Programming Directions for Chemicals and Waste and with Stockholm convention obligations, global environmental benefits as relates to POPs will accrue in particular from release reduction of unintentionally produced POPs, preliminary estimated at 12gTEQ/year using the UNEP toolkit taking into account replication, as well as release reduction of brominated flame retardants. The program however does not involve disposal of PCBs or obsolete pesticides and so the indicator of tons of POPs disposed of in Table E cannot be applied directly.

PART II: PROGRAMMATIC JUSTIFICATION

Program Description. Briefly describe: a) the global environmental and/or adaptation problems, root causes and barriers that need to be addressed; b) the baseline scenario or any associated baseline program/projects; c) the proposed alternative scenario, with a brief description of expected outcomes and components of the program; d) *Incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF/SCCF and co-financing; and e) Innovation, sustainability and potential for scaling up.*

Global environmental problems, root causes and barriers that need to be addressed:

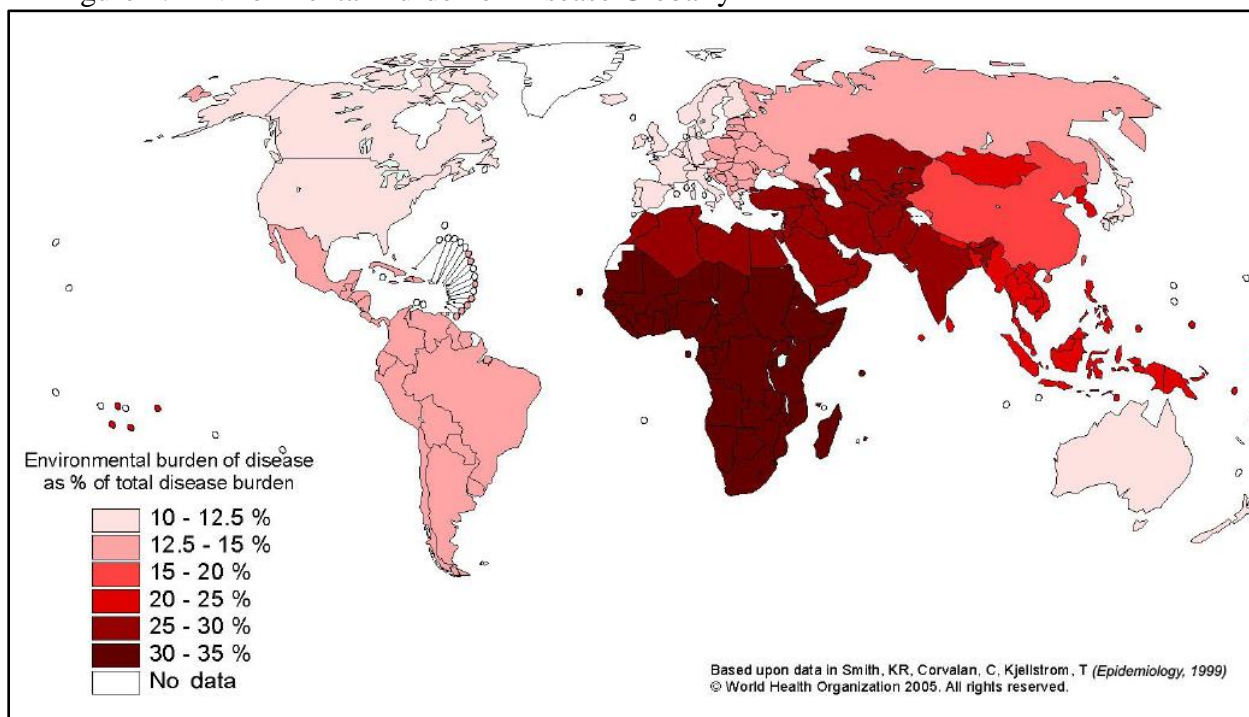
- 1. Africa's GDP has been growing at a fast pace, above the world average (3%) at a rate of 4.7% in 2013 and 5.8% in 2014².** The region has also experienced the highest urban growth during the last two decades at 3.5% per year and the share of the urban population is expected to increase from a baseline of 36% in 2010 to 50% and 60% by 2030 and 2050 respectively. In parallel, African countries are trying to revive national and regional level industrialization, especially through lower value stages of the global chains, characterized by the dominance of agricultural and raw materials. The continent's urbanization rate, the highest in the world, and the drive towards industrialization can lead to economic growth, transformation, and poverty reduction. However, it can also lead to increased inequality, urban poverty, and the proliferation of slums, while exploitation and processing of the resources can, and has, resulted in environmental pollution and degradation. Most Sub-Saharan African cities are characterized by insufficient basic infrastructure, particularly in low-income areas and it is estimated that about 60% of African citizens live in places where water supplies and sanitation are inadequate³. African Governments face challenges related to inadequate capacity to effectively monitor the use of chemicals, lack of capacity for regulation and weak enforcement, lack of access to cleaner production systems, technologies for waste management and availability of information.
- 2. As per recent estimates, over 200 million people are exposed to toxins at dangerous levels in the developing world and pollution is a leading cause of death in low- and middle-income countries. An estimated 25% of death and disease globally, and nearly 35% in regions such as sub-Saharan Africa, is linked to environmental hazards. (Figure 1)⁴.** In 2012, 12.6 million people died as a result of living or working in an unhealthy environment, representing 23% of all deaths. When accounting for both death and disability, the fraction of the global burden of disease due to the environment is 22%.

² AfDB: African Economic outlook 2014

³ AfDB: Urbanization in Africa; Dec 2012

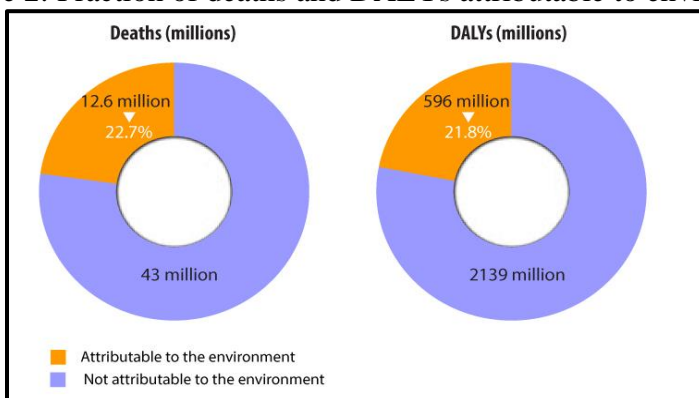
⁴ Priority environment and health risks: The Health and Environment Linkages Initiatives: WHO and UNEP

Figure 1: Environmental Burden of Disease Globally



Source: HELI: WHO and UNEP

Figure 2: Fraction of deaths and DALYs attributable to environment globally



Source: Global Health Observatory (GHO) data: WHO (2012)

- Industrial growth, increased pressure on unplanned urban infrastructure, exploitation of natural resources (mining) is associated with the generation and the release of toxic chemicals and hazardous waste that enter the environment and the food chain and have potential health impacts on humans. Africa has also witnessed significant trade of hazardous material that is reflected in its significant share of toxic contaminated sites. The mismanagement of chemicals, releases of unintentionally produced POPs (UPOPs) from open-burning and other sources, stockpiles and chemical waste including persistent organic pesticides, polychlorinated biphenyls (PCBs) and heavy metals such as mercury, and releases of chemicals in products such as polybrominated diphenyl ethers (PBDEs) and other brominated flame retardants present serious threats to human well-being and the

environment in many parts of Africa. Because of their global reach, some of these chemicals – the focus of this Program – are addressed by global conventions that aim to reduce or eliminate their use or releases: the Stockholm Convention on POPs and the recently adopted Minamata convention on mercury.

- 4. The issue of electrical and electronic waste has created significant environmental health risks in sub Saharan Africa (SSA).** Improving e-waste management including addressing unsound recycling practices leads directly to POPs release and exposure reduction, notably from UPOPs and PBDEs. It is in line with the Stockholm convention and is a priority for the participating countries as evidenced for example from the updated NIPs submitted by Kenya and Senegal⁵ to the Convention Secretariat. Over the past 10-20 years, the market for Information and Communication Technologies (ICT) has grown exponentially to at least US\$2 trillion in 2013 and is estimated to be the fastest growing waste stream in the world at 20-50 million tonnes per year⁶. The issue of e-waste has been migrating to developing countries in both Asia and Africa; countries which typically do not have the resources or infrastructure to manage the high volume, of often hazardous, waste. The number of African countries confronting this issue is large and growing.
- 5.** The e-waste issue is complex. While it can be seen as a valuable commodity with more than 92% recoverable and reusable commodities (gold, silver, copper, palladium and other compounds) available through processing, it is also a serious hazardous waste problem. Primitive recycling techniques such as burning cables for retaining the inherent copper expose workers (both adult and children) as well as their families to a range of hazardous substances. E-waste-connected health risks may result from direct contact with harmful materials such as POPs (e.g. PCBs) and heavy metals (lead, cadmium, and chromium), from inhalation of toxic fumes, as well as from accumulation of chemicals (e.g. PBDEs) in soil, water and food. In addition to its hazardous components, being processed, e-waste can give rise to a number of toxic by-products likely to affect human health including UPOPs and PAHs. It is estimated that over 3 million people are at risk of exposure to toxic chemicals through e-waste, due to their small size and stage of development. Individuals, particularly children, involved in the ‘recycling’ of e-waste face the highest risk where exposure to lead and cadmium from cathode ray tube (CRT) processing or to polycyclic aromatic hydrocarbons (PAHs) and other toxic chemicals from burning plastics and cables is common. The Secretariat of the Basel Convention (SBC) recently reported that in some West African countries children as young as five undertake the dismantling of small parts and sorting of materials while older children participate in collecting, dismantling and processing.
- 6.** Open burning of non-segregated urban wastes and other toxic wastes (including e-waste, plastics containers, tires etc), results in incomplete combustion and release of unintentionally produced POPs (UPOPs), and pose a public health risk in terms of spreading of infectious diseases. The widespread and unregulated dumping of municipal solid waste (MSW), comingled with hazardous, industrial and medical waste in urban areas is posing serious challenges in Africa where many cities are getting rapidly urbanized.

⁵ Kenya National implementation plan for the Stockholm convention on persistent organic pollutants – 2014-2010 and Sénégal Plan national de mise en œuvre de la convention de Stockholm sur les polluants organiques persistants - 2016

⁶ StEP (Solving the E-Waste Problem (StEP) Initiative")

Such dumpsites are associated with open burning practices, scavenging and informal recycling. Reducing open-burning practices and improving solid waste management leads directly to the reduction of releases and exposure from POPs, in particular from UPOPs. As can be seen from their NIPs, open-burning is a significant source of UPOPs releases in the participating countries, and a priority for Stockholm convention implementation. In countries like Zambia and Senegal where medical waste and hazardous mining waste are typically comingled with domestic solid waste, these dumpsites are a further source of toxic pollution to the neighbourhood communities. The widespread use of PCBs in electrical equipment (for insulation and in transformer oil) and its uncontrolled disposal is posing also serious challenges in Africa.

- 7. Artisanal and small-scale gold mining (ASGM)** is an important sector contributing significantly to the GDP of those nations and also providing an important employment opportunity for poor and rural communities and migrant labor. However, **informal, illegal and unregulated nature of mercury use as an amalgam in such operations has created a legacy of severe adverse (and irreversible) environmental damage and health hazards, which are compounded by economic, and social problems**, including child labor, land tenure issues, migration and other social instability and potential conflict. It is therefore a priority of the recently adopted Minamata convention on mercury – which all participating countries have signed - to reduce, and where feasible eliminate, mercury use in artisanal and small-scale gold mining. Another source of mercury in the informal sector comes from primary mining of metals that can bear traces of cinnabar in the unused part of the ore (“gangue”). In addition, mercury recycling facilities can also be a major source of illegal mercury trade that should be closely monitored to avoid bringing mercury back to the market. It is estimated that about 3.5m people are at risk of health impacts in the ASGM sector of which 2.5m are in Africa⁷. Mercury is a dangerous neurotoxic with significant health and economic consequences, which has broader multi-sectoral risks beyond direct health risks to miners and their families. Mercury contamination poses potentially serious economic consequences to the lucrative local and regional fisheries with potentially grave economic consequences due to its bio-accumulation in organic tissues and along the food chain. In Tanzania, for example, ASGM is carried out near major freshwater lakes such as Victoria, Nyasa, Rukwa and Tanganyika which host thriving fisheries for export and local consumption. It is estimated that 90 to 95 percent of mercury used in many African nations is obtained illegally and/or smuggled, posing a serious governance challenge. Institutional capacity (both technical and administrative) to monitor use of mercury as well as its health and environmental consequences is limited, which will constrain African Governments’ ability in monitoring and reporting mercury usage as per their commitment under the Minamata Convention. An initial best estimate on consumption of mercury in Sub-Saharan Africa is indicated below (Figure 3) and highlights the preponderance of ASGM⁸:

⁷ UNEP’s Global Mercury Assessment of 2013

⁸ World Bank funded study on Mercury trade diagnostics, 2016

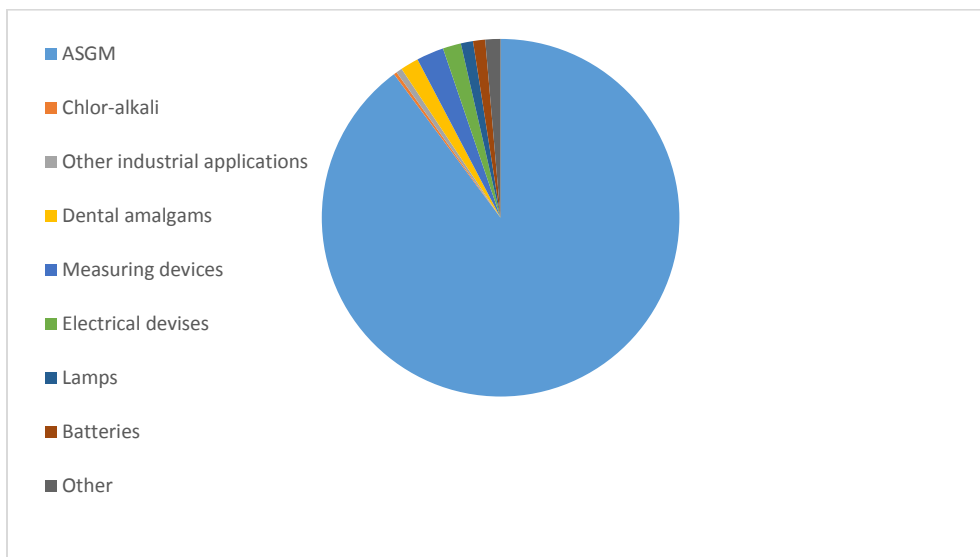


Figure 3: Consumption of Mercury in SSA

8. Requirements under the Minamata Convention include the phase-out of existing mercury mines, control measures on air emissions, and international regulation of the informal sector for artisanal and small-scale gold mining. The biggest challenge is the capacity of member countries to address their commitments, as ownership by client government remains unclear, responses to regional trade in mercury remain fragmented and impacts on health and environment due to mercury remains poorly understood.
9. Many of these issues have not been addressed due to several institutional, policy, technological and financial barriers. Key barriers to reducing environmental health risks of POPs, mercury and other harmful pollutants in Africa region are as follows:
 - a) **Lack of access to concessional financing has hampered adoption of cleaner technologies, its replication and scaling up in most countries.** The background work done by the team indicates that many past efforts at demonstrating use of cleaner technology to minimize mercury use has not been very successful in terms of sustainability. However, given the size and economies of scale, many of the ASGM operators tend to be less organized in terms of budget and financial management, thereby being less credit-worthy for commercial banks. Given these challenges, the project would explore options to enhance credit worthiness of small scale sector by minimizing their borrowing risks. The project will attempt to further leverage World Bank's IDA resources to create enabling environment for the ASGM operators, such as enhanced capacity for financial management, improved reporting and disclosure of revenue and expenditure data, as well as compliance with the fiduciary and safeguards requirements consistent with internationally acceptable norms
 - b) **Relatively weak legal and regulatory framework and limited institutional capacity at country level** to analyze and address the issues and absence of effective enforcement by environmental regulatory agencies. Regulatory and environmental protection agencies are frequently underfunded and under-capacitated, which means that there is little effective enforcement, with no disincentives for polluters to ignore costs of addressing environmental health issues associated with their business activities In several cases, the lack of clear regulatory requirements, such as in field of waste

management, has led to amplification of environmental health risks in urban areas. Similar complex situation exists in case of mercury contamination due to artisanal and small gold mining (ASGM), where it is difficult to establish and apply the polluter pays principle due to the informal nature of activities.

- c) **Illegal Trade in mercury and e-waste.** Even in those countries which have instituted comprehensive laws and policies, Governments are constrained in implementation and enforcement due to limited data on trade and use, inadequate capacity of custom officials and insufficient opportunities for demonstrating good practices in cleaner technologies. At regional level, many African countries are affected by ongoing illegal trade in mercury in ASGM and e-waste, and they realize that it is difficult to regulate without regional collaboration or a regulatory/institutional framework that would prevent transfer of illegal mercury and e-waste problems when the enforcement becomes uneven across international borders.
- d) **Inadequate waste management infrastructure and informal waste management systems.** Old and mixed waste dumpsites can contain a cocktail of POPs-containing products and articles, electrical and electronic waste, industrial and hospital waste exacerbating the potential environmental health impacts to neighborhood communities which are often poor. Lack of formal systems for waste collection, recycling and disposal and absence of scientifically designed landfill sites are a major contributor to the continued use and increasing numbers of mixed-waste dumpsites within urban centers. This is further enhanced by the absence of systematic and coordinated land-use planning mechanisms, which intensifies competition for land and creates conflict among different users, with negative consequences on livelihoods and environmental health. This issue is apparent in fast growing urban centers such as Agbogbloshie in Accra, Ghana, Dalifort and Maristes municipalities in Dakar, Senegal and also in the town of Kabwe in Zambia where mixed waste dumpsites harbor rag-pickers who are unemployed or ex-miners.
- e) **Lack of data and information about environmental health risks of exposure to pollution from POPs and mercury and other chemicals and waste.** Waste dumps and other chemically contaminated sites are mostly on publically owned land, and are surrounded by marginalized and poor communities, who scavenge in the dumpsites and typically bear the brunt of environmental health costs. Contaminated sites typically have little or no net positive economic value to the affected communities, but once they are cleaned up, can become a source of revenue for the public sector or private developers, especially in urban areas where demand for land increases with increased population and economic growth. What is lacking in most countries is a systematic dialogue on how to best ensure that societies benefit from proper land planning and use, consistent with national priorities and legislation, in order to create the fundamental socio-economic conditions necessary for the long-term reduction of environmental health risks.
- f) **Lack of effective national and regional coordination within Africa region to reduce the environmental health risks from trade and use of mercury in ASGM.** At the national scale there is often a lack of strategic coordination between the range of official and private sector actors involved in regulating production, trade, distribution and use of mercury, and an absence of dedicated capacity within regulatory agencies. Internationally, despite improved efforts to enhance coordination, a vast volume of mercury trade goes undetected and unprosecuted, with the large miners and middle men extracting the largest sums of value from the gold supply chain. There is a need to address the illegal mercury trade of the gold value chain, whilst simultaneously

addressing the supply and demand ends of the chain. Miners need to have direct access to global gold market to receive a fair price for the gold. In addition to formalization and demonstration of technologies, access to finance is needed for the miners to invest in clean production methods.

- g) **Inadequate efforts at national and regional scales to raise awareness and reduce consumer demand for illegally traded mercury.** Despite past public awareness programs in many African countries, there remains a high level of misinformation and ignorance about health costs, risks and impacts of exposure to environmental pollution from chemicals and waste, including mercury and POPs. Awareness raising is also needed in source and transit countries, to promote understanding of the negative impacts of the exposure to pollution.
- h) **Lack of technical, financial and managerial capacity to demonstrate results on the ground, and set up institutional mechanisms to promote innovative techniques, practices and approaches for the elimination and reduction of harmful chemicals and waste.** The access to efficient and cost-effective technology has been a constraint in reducing mercury usage in ASGM. The difficulty of accessing finance is also often a barrier in adoption of cleaner technologies. Nevertheless, it is the fundamental responsibility of governments to ensure the provision of adequate waste management services by creating an enabling environment for the private sector and local NGOs, to invest in waste management activities, to promote alternative to poor practices in waste management and ASGM and to create jobs.

10. Multiple and fragmented approaches to deal with specific chemicals have not yielded the most effective results. The rationale behind this Program proposal is the fact that past experiences have shown that isolated policy and regulatory reform interventions in one country may not necessarily produce significant results, but rather run the risk of shifting the problem toward other countries where regulations and enforcement are weak. There have been many programs which have been implemented in the region by various development agencies, funded under GEF, and by bilateral donors. Although the coverage of GEF POPs activities is broad, in fact there are not that many projects that have delivered on the ground yet. Many of the programs have been site-specific and uncoordinated, which has prevented a sustained and comprehensive impact on the management of hazardous chemicals, resulting in minimal improvement on environmental health and pollution impacts. Emerging recommendations from the studies and assessments conducted during the preparation of this program support a need to harmonize efforts and to understand the institutional capacity constraints and their economic, environmental and social implications both at the national and regional levels.

11. Some of these barriers have been addressed at country level through multiple initiatives under the framework of Multilateral Environment Conventions. They present an opportunity to engage on environmental health issues at regional level also. The Minamata Convention on Mercury provides an opportunity to catalyze policy reforms to protect human health and the environment from the adverse effects of a toxic compound. The Stockholm Convention is a global treaty to protect human health and the environment from persistent organic pollutants (POPs). The Strategic Approach to International Chemicals Management (SAICM) is a policy framework to foster the sound management of chemicals. Under the Stockholm Convention, a total of 26 chemical substances are listed as POPs, including pesticides (such as DDT), industrial chemicals (such as PCBs) and unintentional by-products of industrial or combustion processes (such as dioxins and furans

or “UPOPs”). The program would leverage partnerships developed and build on initiatives under the Stockholm and Minamata conventions, as well as under the Basel convention as appropriate. Various guidance documents have been developed by the Stockholm Convention to help parties fulfil their obligations. The Stockholm and Basel conventions, which share a joint Secretariat have also established a network of regional and sub regional centers to provide technical assistance and to promote transfer of technologies, including four in sub-Saharan Africa, two of which are joint. Under the Basel convention, the Partnership for Action on Computing Equipment (PACE) was launched in 2008 that includes public and private multi-stakeholders providing a forum for representatives of personal computer manufacturers, recyclers, international organizations, associations, academia, environmental groups and governments to tackle environmentally sound refurbishment, repair, material recovery, recycling and disposal of used and end-of-life computing equipment. In 2015, PACE was requested to develop a strategy and workplan for the implementation of concrete actions at the regional and national levels. Similarly, the UNEP Global Mercury Partnership consists of stakeholders from governments, industry, NGOs, and academia who are dedicated to protecting human health and the environment from the impacts of mercury, and to reducing global environmental releases of mercury. Initiated in 2005 by a decision of the UNEP Governing Council, the Partnership played an important role in catalyzing global action on mercury and offering information, capacity-building, and awareness-raising in support of international negotiations to establish a legally-binding instrument on mercury.

12. Context of the Program. While there has been progress over the last decade, with all African countries for example developing their initial NIP under the Stockholm convention, focused and targeted interventions in the Africa region to address the environmental health impacts of POPs, mercury and other hazardous chemicals are relatively few and small. They are often fragmented efforts that provide technical solutions without necessary and complementary institutional approaches to strategically target environment and human health issues that are considered priority at the highest level in governments. Additionally they often do not fully engage affected communities in pollution management stewardship, nor can they leverage the benefits generated from reduced environmental health risks. Finally, policies, laws and penalties are often an opportunistic patchwork creating implementation challenges, compounded by a fragmented approach focusing on one chemical after the other. Extensive consultations with African client governments and partners in preparation of this Program indicate that there is a common understanding and demand for a more harmonized approach towards reducing environmental risks resulting from mercury waste and POPs emissions. Feedback from multiple client countries indicate that - a) the resources and opportunities provided through multiple conventions could enhance impacts through an integrated approach; and b) there is significant room for countries in Africa to collaborate and learn from each other on institutional, regulatory and financial aspects of reducing environmental health risks.

13. The World Bank has responded to requests from participating countries to leverage its convening power at the highest levels of national governments, led by Ministry of Finance, to help accelerate action toward addressing commitments under the above mentioned Conventions. The World Bank’s comparative advantage is its ability to leverage resources, convene stakeholders around the issue and lead a dialogue both at national and regional levels. The Bank brings its unique convening power to help elevate the policy dialogue to focus on shifting the allocation of resources from national budgets to meet Convention

obligations and promote increased contributions from the private sector. This will allow GEF interventions to be sustained after the projects and programs are completed, building on the co-financing leveraged for this program from the WB through IDA funding (US\$ 240m). Activities with high environmental health consequences, such as artisanal gold mining, e-waste recycling and scavenging in urban dumpsites are a reflection of poverty and vulnerability; usually a livelihood option for the poor and marginalized people often unaware of long term impacts to health and the surrounding environment. These are complex social and economic, as well as environmental, challenges, requiring an integrated and long-term approach through policy, infrastructure and health investments and capacity building and awareness interventions. While focusing on higher level objectives of environmental health risks, the program is targeted to activities that bring about measurable reduction of POPs and mercury through application of cleaner technologies and approaches for eliminating releases from waste and other sources.

14. The need for a regional approach is predicated not only on the physical transboundary nature of mercury and POPs emissions and impacts, but on regional opportunities for solutions and regional causes for mismanagement. The preparatory studies and assessments carried out through the GEF-funded MSP⁹ on “Reducing Environmental Health Impact of Harmful Chemicals in Africa Region” and under the World Bank’s Pollution Management and Environmental Health (PMEH¹⁰) program validate a regional approach to addressing these issues. For example, the recently commissioned Mercury Trade study, under the GEF-MSP, revealed significant gap between the estimated consumption of mercury and official imports, indicating that there is major illegal trade across African countries. Illegal traffic is also prevalent with eWaste. Unless there is a regionally-harmonized policy on mercury import licensing and its use in the ASGM sector, country-level interventions may not have the desired outcomes. There are existing regional entities that the program will leverage to further enhance the national level interventions. These include the Regional Economic Communities (REC) such as ECOWAS, COMESA and SADC, to support such regional harmonization, thereby strengthening national and regional systems to enforce regulations and manage illegal trade flows. For example, the adoption of pesticides regulation in one country of ECOWAS automatically applies to other countries. Countries also can gain also from a shared response. For instance, the current Bank engagement in Tanzania for formalization of ASGM miners is being closely observed for relevance and customization in other countries. The RECs provide therefore an opportune platform to promote experience-sharing and harmonization of appropriate policies and dissemination of good practices and lessons learned through development of tested models and methodologies.

15. The program would leverage opportunity to address some of the environmental health concerns presented through the GEF-6 chemicals and waste focal area strategy, whose long term goal is to “*prevent the exposure of humans and the environment to harmful chemicals and waste of global importance, including POPs, mercury and ozone depleting substances*”. Local, regional and global environmental benefits would be achieved through integrating GEF resources with identified IDA-supported baseline activities that will enable tackling key environmental health and pollution issues in an integrated manner. The

⁹ Reducing Environmental Health Impact of Harmful Chemicals in Africa Region (https://www.thegef.org/gef/project_detail?projID=5583)

¹⁰ World Bank’s multi-donor Trust funds under the Pollution Management and Environmental Health (PMEH) program aims to address environmental health related risks at the country and regional levels and constraints faced by the national and international community to tackle these.

GEF funding will support the work at national and regional scales to disrupt illegal trade infrastructure for mercury, promote regional collaboration at the institutional level, and validate models to manage POPs/waste issues in large developing urban areas, and raise awareness and understanding of toxic pollution. The program is based on realization that most African countries are signatories to various other environmental multilateral conventions, including Basel Convention on the control of transboundary movements of hazardous wastes, the Rotterdam Convention for promoting shared responsibility and cooperation among Parties in the international trade of hazardous chemicals, the Bamako Convention on the Control of the Transboundary Movement and Management of Hazardous Waste within Africa, and the ILO's 1990 Convention on the Safety of Chemical Products at Work.

Baseline scenario and associated baseline program/projects:

16. The program is designed to complement and partner with related GEF supported projects and other initiatives in targeted countries. The program complements a number of planned or ongoing activities as outlined below:

| Country | Summary of Intervention by other Partners |
|----------|--|
| Zambia: | <p>UNEP: Regional Project on the Development of National Action Plans for the Artisanal and Small Scale Gold Mining in Africa – Development of National Action Plans to reduce the use of mercury and mercury compounds in, and the emissions and releases to the environment of mercury from, artisanal and small-scale gold mining and processing.</p> <p>UNEP: Integrated Health and Environment Observatories and Legal and Institutional Strengthening for the Sound Management of Chemicals in Africa (African ChemObs).</p> |
| Tanzania | <p>UNEP: Development of National Action Plans for Artisanal and Small Scale Gold Mining in the United Republic of Tanzania.</p> <p>UNEP: Integrated Health and Environment Observatories and Legal and Institutional Strengthening for the Sound Management of Chemicals in Africa (African ChemObs).</p> |
| Senegal: | <p>UNIDO - Minamata Convention Initial Assessment in Francophone Africa I - Pre-ratification activities under the Minamata Convention to enable policy and strategic decision making and to prioritize areas for future interventions.</p> <p>UNEP - Development of National Action Plan for Artisanal and Small Scale Gold Mining Mali and Senegal.</p> <p>UNEP: Integrated Health and Environment Observatories and Legal and Institutional Strengthening for the Sound Management of Chemicals in Africa (African ChemObs).</p> |
| Kenya | <p>UNEP: Integrated Health and Environment Observatories and Legal and Institutional Strengthening for the Sound Management of Chemicals in Africa (African ChemObs).</p> <p>UNEP - Regional Project on the Development of National Action Plans for the Artisanal and Small Scale Gold Mining in Africa</p> |

| | |
|-------|---|
| Ghana | UNDP - Development of Minamata Convention Initial Assessment (MIA) for Ghana. UNIDO - National Action Plan on Mercury in the Artisanal and Small-scale Gold Mining Sector in Ghana |
|-------|---|

- 17.** The program recognises that there will be linkages with other initiatives to ensure complementarities and avoid overlaps. For example, the proposed program is complementary to the ChemObs in terms of engagement with client countries on policy and regulatory aspects. The ChemObs project is focused on identifying problems and issues, and will help provide the necessary information for design and demonstration under the IDA funded projects in Zambia and Tanzania. The proposed program will build on the ChemObs project through specific assistance to strengthen mining policy and regulations focusing on Artisanal Gold Mining sector; strengthen institutional processes and capacity to be able to identify, analyze and address problems associated with environment and health impacts, and leverage baseline IDA funds in the countries to demonstrate results on the ground through catalytic investments, and deliver on elimination of Mercury and UPOPs.
- 18.** This program builds on over one year of preparatory work done under GEF supported MSP in multiple countries as well as experience of the World Bank and other partners on improving the pollution management and environmental health impacts due to chemicals and waste, including efforts to strengthen enforcement of legislation and compliance for reduced risks. The World Bank is currently engaged in multiple interventions in the targeted countries to address environmental health risks. These interventions provide a solid understanding of key institutional, policy and regulatory issues that are complementary to objectives of Stockholm and Minamata conventions. For example, since ASGM activities are often illegal and in remote areas, miners and communities are unable to access basic health services. There is well-documented understanding that ASGM therefore requires not just technological support but also the supportive services required for sustained improved living conditions. The larger context provided with the program is essentially in support of reduction of environmental health risk through a comprehensive and holistic approach, while clearly recognizing that the allocated funds and targeted interventions will be directed only for specific POPs and mercury reduction activities.
- 19.** The World Bank has focused increased attention in recent years on the complex problems of reduction of environmental health risks, and assists member governments and international initiatives that seek to support more effective assessment of risks and innovative solutions through partnerships in order to address the issue of use and dumping of harmful chemicals. The Bank's comparative advantage in this work stems from its capacity to associate baseline development funding to GEF incremental funding to move beyond limited scope technology demonstrations to approaches to address these issues more broadly. The World Bank has been very active in the Africa region through its engagement in mining, urban and IT sectors. For example, the Bank's current engagement in Tanzania in the mining sector particularly in last 5 years has reinforced the need for a program that is focused on addressing environmental health issues in the ASGM sector. Similar engagement in Ghana in the mining sector has laid out a roadmap for policy /regulatory interventions and engaging mining communities. The current engagement in the urban sector in Kenya has indicated a dire need to address POPs releases and

environmental health issues resulting from open burning of mixed waste, including electronic waste.

- 20.** In addition, several recent and planned World Bank investments provide a robust baseline for designing interventions under the national projects. The child projects descriptions provide details of these baseline investments being considered in their specific context, including: i) US\$60 million IDA project in Zambia – Mining and Environmental Remediation and Improvement Project; ii) US\$60 million IDA project in Tanzania Mining Sector Development Project and Lake Victoria Environmental Management Project; and iii) the Natural resources and Environmental Governance Technical Assistance (IDA \$6 million) grant to Government of Ghana in support of natural resource management in mining sector. The Global Alliance on Health and Pollution (GAHP), a platform of several partner agencies including multilateral development banks, bilaterals and UN agencies supported by the World Bank has also created significant opportunities to make good use of the technical experiences and capacities from the various member institutions and respond effectively to demand from clients in African countries for cleaning up chemicals and toxic hotspots, preventing recontamination and improving health outcomes. The foundation of the earlier Africa Stockpiles Program (ASP), makes a strong case to adopt a consolidated approach to improve individual government capacity at a regional level for sound management of chemicals and hazardous wastes, including POPs and mercury.
- 21.** The program will also complement the World Bank’s multi-donor Trust funds under the Pollution Management and Environmental Health (PMEH) program that is designed to address environmental health related risks at the country and regional levels. The proposed program is informed by the Bank’s partnership with the WHO as well as through the GAHP, which supported baseline assessment of sites contaminated with chemicals in several African countries. Drawing on examples of practical country specific solutions from the field can also provide valuable lessons. While selecting a pilot site or country, the team would draw from experience and work done by various organizations in multiple African countries, such as WWF, Artisanal Gold Council, NRDC etc.
- 22.** All the commitments and investments mentioned above embody the baseline that represents the underlying finance upon which GEF investment is expected to make an incremental difference. The efforts envisaged under this Program are complementary and will build upon these existing activities, while creating the conditions for mainstreaming of the Chemicals agenda within development priorities and scaling up. This program will also complement the ongoing MIA, NAP, NIP (review and update) development processes in the various participating countries in partnership with other GEF Implementing Agencies (UNDP, UNEP, UNIDO) and will provide the opportunity for supporting further policy enhancements while building capacity for improving monitoring and enforcement of the regulations. This program will help expand opportunities for exchange of lessons learned and good practice across the region. The GEF funding will be incremental to the baseline in that it will make advances in understanding and addressing the institutional and technical complexities of environmental health and pollution management issues related to POPs and mercury and other harmful chemicals and waste. The program will provide an opportunity for integration leading to increased cumulative positive impacts, including a push for regional integration, addressing similar and frequently overlapping stakeholders with limited capacity to manage chemicals agenda. The program is also looking to elevate the dialogue between the World Bank and the Ministries of Finance.

23. Finally, this program will complement and provide the opportunity for supporting further policy enhancements in small-scale mining, while building capacity for improving monitoring and enforcement of the regulations. This includes building on the original efforts under the GMP (Global Mercury Project) initiated by UNIDO which worked to demonstrate ways of overcoming barriers to the adoption of best practices, waste minimization strategies and pollution prevention measures. The GMP, funded by the GEF is complemented by a suite of ongoing activities that are financed either through the participating countries' resources and/or bilateral programs.

Proposed alternative scenario, with brief description of expected outcomes and components of the program:

24. The Program Development Objective (PDO) of the regional **Environmental Health and Pollution Management Program (EHPMP)** is to “Reduce environmental health risks related to harmful chemicals and waste through strengthened institutional partnership and capacity in pollution management in targeted countries in Africa”.

GEF focal area strategy, eligibility criteria and priorities

25. The proposal responds to the GEF 6 Chemicals and Waste Focal Area Strategy that aims to achieve the long-term goal “to prevent the exposure of humans and the environment to harmful chemicals and waste of global importance including POPs, mercury and ozone depleting substances.” As designed, the program is consistent with the GEF-6 objective CW#2: Reduce the prevalence of harmful chemicals and waste and support the implementation of clean alternative technologies/substances, Program 3: Reduction and Elimination of Persistent Organic Pollutants, and Program 4 Reduction or Elimination of anthropogenic emissions and releases of mercury to the environment. The proposal is also informed by the global conventions for which the GEF is the financial mechanism, the Stockholm Convention on POPs and Minamata Convention on Mercury, as well as other relevant multilateral environmental agreements such as the Basel Convention on the Control of Transboundary Movements of Hazardous waste. The development and implementation of the Program and child projects will be underlined by participating countries' obligations under the Stockholm Convention, in particular Article 5 on *Measures to reduce or eliminate releases from unintentional production*, and Article 6 on *Measures to reduce or eliminate releases from stockpiles and wastes*, and following relevant guidance such as the *Revised draft guidance on best available techniques and best environmental practices for the recycling and waste disposal of articles containing polybrominated diphenyl ethers listed under the Stockholm Convention* and the *Guidelines on best available techniques and provisional guidance on best environmental practices relevant to Article 5 and Annex C of the Stockholm Convention on Persistent Organic Pollutants*. Regarding the Minamata Convention, the Program and child project will build and rely on existing work, and in particular guidance developed through the Global Mercury Partnership such as the *Draft guidance on developing a national action plan to reduce and, where feasible, eliminate mercury use in artisanal and small-scale gold mining* and others, as well as pay close attention to the development and adoption of emerging

guidance as the Convention matures. All the participating countries have ratified the Stockholm Convention and signed the Minamata Convention, as detailed below:

| Country | Stockholm Convention | | | Minamata Convention |
|----------|----------------------|----------------|---------------------|---------------------|
| | Ratified | NIP | Implementing agency | Signatory |
| Kenya | September 2004 | 2007 - updated | UNEP | October 10, 2013 |
| Tanzania | April 2004 | 2005 | UNIDO | October 10, 2013 |
| Ghana | January 2008 | 2007 | UNIDO | September 24, 2014 |
| Senegal | May 2003 | 2007 - updated | UNEP | November 10, 2013 |
| Zambia | July 2006 | 2009 - updated | UNIDO | October 10, 2013 |

26. With all participating countries having signed the and prepared or in process of preparing their Minamata Initial Assessment and National Action Plan (NAP), the regional program will learn from and complement these initiatives.

Program Design

27. The program while focusing on discrete chemicals – POPs and mercury, consistent with the GEF’s mandate as financial mechanism for the Minamata and Stockholm Conventions, advocates a cohesive and synergistic approach to chemical pollution by offering the common lens of environmental health risks. From our past experience, single theme approaches have been constrained by scale of economies and limited involvement of key stakeholders, leading to limited impacts on the environment and human health. On the other hand, a higher common lens is key to elevating these issues, both at the national and regional levels, to the dialogue between ministry of finance and development partners. The proposed program that brings under one common thread of environmental health, concerns related to urbanization, industrial growth, ASGM, and e-waste, is designed to focus on specific commitment under Stockholm and Minamata conventions in each country in line with country-driven priorities, and to build institutional and technical capacity into the child-projects through offering a menu of options to allow countries to tailor their needs based on their identified priorities, capacity and country context. The program aims to pilot an institutional model to demonstrate economic and technical viability of cleaner technologies while building institutional capacity for regulatory oversight. Pilot activities are designed, not as an end in themselves but more as a process to strengthen the institutional and policy dialogue, and demonstrate how scarce public funds can help mobilize financial flows. The program builds upon and complements ongoing activities or initiatives addressing POPs reduction that provide an important foundation, but have not completely solved the problems at hand due to scope and complexity.

28. The proposed components for each child project are therefore country-specific, and furthermore linked to opportunities provided through the current World Bank IDA

engagement. The program will not only present a menu of options based on diagnostics and in line with country priorities, it will bring internal visibility by aligning countries to find solutions that are complementary and address common drivers of the problems, such as the growing illegal trade in mercury and e-waste. In order to have a significant impact in reducing the environmental health risks from POPs and mercury, and promoting improved pollution management, the proposed EHPMP has been designed to address key disincentives and institutional weaknesses across the chemicals and waste management chain. The program is focused on key environmental health pollutants with specific objective to discuss current country statuses and challenges related to toxic pollutants (such as from Artisanal gold mining, electronic waste), and identify areas of cooperation and collaboration.

- 29.** The EHPMP will leverage targeted investments to reduce mercury emissions and POPs releases from e-waste burning and other unsound recycling techniques, and open-burning of solid waste, to demonstrate reduced environmental health risks. This will include strengthening involvement of mining communities, and improving institutional capacity of custom and border official involved in regulating illegal trade in mercury. It is based on a theory of change that sees both community involvement through benefit sharing and strengthening of state-led compliance and enforcement efforts as essential in addressing environmental health risks. The program will take into account and utilize existing initiatives and platforms, including collaboration with the countries with best practice experiences in artisanal small-scale mining sector. Program objectives address the key root causes and barriers discussed earlier and focus on:
- Demonstrating institutional models and strengthening policy framework and regulatory enforcement;
 - Demonstrating application of cleaner and mercury free techniques to show reduced environmental health risks and economic value; and
 - Increased community demand for better management of ASGM and E-waste sector.
- 30.** The program focuses on policy and institutional strengthening but yet leverages investments as short-term interventions for POPs and mercury reduction. This approach is designed to demonstrate that the outcomes of targeted interventions in reduced mercury emission and reduced e-waste and solid waste burning is reflected in improved ASGM sector management, and reduced health risks and economic benefit in the longer term. Longer term interventions focus on promoting sustainability, community benefits, effective environmental governance by communities including through land use planning and practices. These interventions are designed to act collectively to shift the perception of cost-benefit in relation to the participation by a wide range of actors across ASGM and e-waste management chain. Additionally the program will promote dialogue in the countries (Tanzania, Ghana, Zambia, Senegal and Kenya) in which the child projects are taking place on how to best ensure that communities benefit from improved management of mercury use and e-waste management, consistent with national action planning and relevant legislation, in order to create the fundamental socio-economic conditions necessary for the long-term reduction of environmental health risks and costs for the affected community.
- 31.** The EHPMP will work and collaborate with development partners and build alliances with multiple sectors and funding sources, as the best approach to respond to the environmental health and pollution issues as they reflect a symptom of deeper problems

faced by many African nations. Targeted investments and collaboration between multiple sectors across various countries, such as urban, mining, land use etc. can bring together an integrated approach that would demonstrate an institutional model for growth and poverty reduction. Such an approach can create stronger incentives for local communities to engage in urban and land use planning, improving environmental governance and reduce their poverty levels through public-private partnerships. The program is designed along the following components:

- 32. Component 1 - Institutional strengthening, knowledge and capacity building.** The component will strengthen capacity to address environmental health risks associated with mercury use in ASGM sector and POPs releases from e-waste and solid waste dumpsites. Mechanisms will be developed in pilot countries to identify, finance, implement and monitor feasible environmental and social measures for prioritized contaminated hotspots in each country. This will include in selected countries establishing institutional roles and accountability for past, current and future environmental health risks; accounting for financial resources needed to meet government obligation to address environmental health risks and liabilities; and clarify the distinction between government-owned liability verses private sector responsibility to regularly and progressively address environmental problems by financing the costs of their mitigation. The capacity building will include strengthening the current environmental policies and regulations and capacity to monitor; screen and evaluate health and environmental risks associated with ASGM, e-waste and addressing POPs releases from urban solid waste dumpsites. With respect to ASGM, much attention will be given towards promoting transparency along the whole value chain as central to fair trading relations, so that artisanal miners may negotiate directly with the end buyer a better price for their gold, in line with the global market rate, for greater economic and social stability.
- 33.** Additionally, the program would focus on enhancing regional collaboration within Africa to address the crosscutting issues of illegal trade of mercury and e-waste. This would involve working closely with regional economic forums and national child projects to ensure consistency of policies and plans that is agreed at the regional level.
- 34.** The proposal recognizes the requirement for countries under Article 7 of Minamata convention that requires that “each Party that has artisanal and small-scale gold mining and processing subject to this Article within its territory shall take steps **to reduce, and where feasible eliminate, the use of mercury and mercury compounds in, and the emissions and releases to the environment of mercury from, such mining and processing**”. This component will support countries to eliminate: (i) Whole ore amalgamation; (ii) Open burning of amalgam or processed amalgam; (iii) Burning of amalgam in residential areas; and iv) Cyanide leaching in sediment, ore or tailings to which mercury has been added without first removing the mercury. Many of the above mentioned commitments would require a regional approach to build harmonised policies and institutional capacity to facilitate countries in addressing their national commitments under the Minamata Convention. This regional approach will also include assistance to countries to facilitate the formalization or regulation of the artisanal and small-scale gold mining sector; and assessment of national and regional baseline estimates of the quantities of mercury used, imported and the practices employed in artisanal and small scale gold mining and processing within their territory. The component will include: Assistance in development of strategy for promoting the reduction of emissions and releases of, and exposure to,

mercury in artisanal and small-scale gold mining and processing, including mercury-free methods; Managing trade and preventing the diversion of mercury and mercury compounds from both foreign and domestic sources to use in artisanal and small scale gold mining and processing; Involving stakeholders in the implementation and continuing development of the national action plan; and a public health strategy on the exposure of artisanal and small-scale gold miners and their communities to mercury. Such a strategy would include gathering of health data, training for health-care workers and awareness-raising through health facilities. The component will support formalizing the ASGM sector by working with the Government of Ghana on policy recommendations and supporting the Government of Tanzania on implementing their recently revised policy on ASGM.

- 35.** This component will also support enabling environment for environmentally sound management of e-waste by working with the Government of Kenya on building capacity, strengthening national institutions, legal regulatory framework, and stakeholder involvement, including the private sector, NGOs, etc. This proposal will support initiatives taken by Governments of Senegal and Zambia to improve management of urban and electronic waste, specifically to manage environmental health implications of releases of associated persistent organic pollutants from their poor management. This will include actions such as providing recommendations for improving collection and recycling systems and training recyclers and rag pickers on occupational health and safer practices to build their capacities in identification and detection of banned chemicals as appropriate.
- 36.** The recommendations from the regional mercury trade study (being supported under the GEF funded MSP) will be discussed with the country Governments and supported under this component. Capacity assistance would be provided to identify and strengthen the current financial incentives; regulations regarding hot spots near sensitive habitat; safety and contamination of public resources; institutional capacity for pollution control; health and environmental assessments, monitoring and reporting. Specific assistance may include strengthening the capacity of mining and environmental institutions; improving identification and mapping of health risks in targeted areas, developing testing and monitoring capacity for environmental quality (air, water, soil quality) and health screening (for mercury and lead) in and around known hotspots. This component will support reduction of environmental health risks by investing in activities that: i) improve the enforcement capacity; ii) improve environmental compliance management and enhance related community livelihood benefits and; iii) promote integrated environmental management approach involving multiple sectors and jurisdiction.
- 37.** The recently completed Mercury Trade Diagnostic study revealed the lack of transparency in import, use and disposal of mercury in ASGM sector. The following three lessons would be incorporated into Component 1 – (a) The policy and regulatory aspects of mining will be strengthened to include provisions for recognition of legal import of mercury. (b) A country level inventory and tracking of mercury import and use in the ASGM sector would be implemented as part of capacity building plan and (c) The artisanal miners will be trained to understand the cost-benefit analysis of producing mercury from illegal traders versus associated environmental health costs which does not get addressed due to non-transparent transactions. This supply chain of mercury and gold will include procurement of cheap and reliable source to mercury, access to credit and technical knowhow licensing, extraction and amalgamation; final gold sales and prices. Artisanal miners are expected to use these benefits to increase their organizational ability to trade responsibly, to respect

and improve the lives of those who work with them, the communities in which they work and the environment.

38. Capacity building interventions will be based on further institutional diagnosis, broad and active stakeholder engagement, and best international practices in reducing mercury emissions in ASGM sector, as well as reduced open burning of e-waste through improved pollution prevention, monitoring, enforcement and compliance. This component on improving capacity of environmental regulators will work primarily with government agencies and invest in five types of interventions:

- Developing and/or strengthening good policies and procedures to enforce existing environmental regulations;
- Building credible institutions and broad constituencies to effectively regulate mercury pollution and e-waste burning;
- Strengthening community level monitoring, through involvement of communities and link to demonstrative investments;
- Supporting capacity building of law enforcement agencies such as customs and border control environmental regulators; and
- Developing information based and remote sensing tools and techniques to track and monitor use and disposal of mercury and e-waste within the Africa region.

39. The capacity building component will also include developing shared protocols and methodologies for assessment of environmental health risks associated with ASGM and urban waste sector based on site (and country) specific health and environmental data, knowledge, risks and impacts.

40. Component 2 – Policy dialogue and regulatory enhancements: The Program will be coordinated by the World Bank which will include enhancing the learning uptake from each child project and maintaining extensive and continued stakeholder engagement at national and international level to support all components of the program. This component will accelerate learning and help strengthen the evidence base and increase transparency to underpin more effective and informed policy making and interventions on environmental health and pollution management. The Program will complement the national projects and will provide opportunities for south-south learning, foster intergovernmental cooperation, use M&E tools, apply best practices and peer review and develop portfolio-wide training and communication strategies. The child projects will be coordinated by key implementing agencies in participating countries – Zambia Environmental management Agency in Zambia; Environmental Protection Agency in Ghana; Ministry of Mineral and Mines in Tanzania, Ministry of Environment and Sustainable Development in Senegal and Ministry of Water and Environment and Natural Resources in Kenya. The component would include support to selected countries developing strategies for introduction of standards for mercury-free artisanal and small-scale gold mining and market-based mechanisms or marketing tools. These will feed into the design and implementation of the pilot demonstrations under component 3.

41. The component – through baseline cofinancing support- will attempt to support countries to address unsafe practices typically associated with artisanal mining. Many artisanal miners suffer from gastrointestinal diseases due to lack of adequate water and sanitation,

poor housing conditions, malaria and dengue, HIV/AIDs and other communicable diseases, multiple chemicals exposure due to mercury, cyanide, lead, DDT etc., ergonomics, poor nutrition and limited access to health care facilities and medicaments. Crushing ore in mills is known to lead to environmental health impacts on children, particularly exposure to fine dust causing occupational lung diseases, pneumoconiosis, silicosis and tuberculosis. The component will seek to raise awareness among miners and residents about the significant environmental impacts that result from release of hazardous waste materials from extraction process: impacts on quality of air, water and soil; from land use changes; impacts on local ecosystems, water resources, and biodiversity; and on availability (and utility) of land for agriculture.

42. This component will coordinate and maintain extensive and continued stakeholder engagement at national and regional level to support all components of the project and to strengthen the impact of national, regional and international processes committed to reducing environmental health risks associated with POPs and mercury and other chemicals and wastes. Some of the ideas proposed in this Program will require exchanges with other donors, NGOs and development agencies that would be promoted through conferences or workshops. It will also strengthen stakeholder engagement and coordination to enable civil society, private sector and academia to have a greater voice in the collaborative pollution management of chemicals and waste. These demonstrative investments will ensure lessons from individual project interventions from within and outside the Program will be shared widely to scale up successes and avoid failures and will support the national implementation of international agreements such as the Stockholm Convention and the Minamata Convention. Investments in knowledge generation and innovation at the regional scale, including and especially in information and communications technology, will spawn results that will be cascaded down into each project. This will exploit economies of scale and ensure rapid and correct uptake of results. This component would be designed to complement the national projects and maximize the efficiency of the broader Program. The regional project also builds on the five national child projects to provide a framework for regional cooperation, involving work to ensure effective coordination and learning between various African countries.
43. Regulatory enhancements for Environmental and Social management will include assistance to strengthen existing legislations with respect to recycling and disposal; financing system for ewaste recycling and disposal (possibly through a prepaid fee, producer responsibility etc); use of cleaner technologies (dismantling and Recycling); and awareness raising and information dissemination.
44. **Component 3 – Demonstrating application of technological tools and economic approaches** - for reduced environmental health risks due to mercury and e-waste: The component will finance specific capacity building and community-focused cleaner technology demonstration activities in contaminated areas that would be prioritized based on social, environment and economic factors. The demonstrative investments will be selected and designed on the basis of environmental health risks and cost effectiveness of interventions. Opportunities to collaborate with the private mining companies in legacy cleaner technology demonstration will be explored. In this context, the proposed project aims to leverage GEF's Chemicals and Waste Focal Area Strategy, which supports, *“Development and demonstration of private sector partnerships, economics instruments and financing models that can achieve large scale and long-term investment in the*

reduction of production and use and emissions of harmful chemicals, including cleaning up contaminated sites and closure". The Program will coordinate investments focusing on developing communication tools to raise awareness about the health costs and benefits of pollution, including community outreach to increase public understanding and visibility of the scale and environmental health impacts. These activities will be precisely targeted, evidence-based and be preceded by a sound analysis during the project preparation phase of what drives behavioral change in a particular cultural setting, and also of global lessons from work attempting to reduce environmental health risks. The program aims to be technology neutral when developing child projects to ensure the most appropriate and cost-effective technology choices are made for each country. The investments will target identification of the community-focused cleaner technologies to support local level problem solving throughout the supply chain. The demonstrative investments will be based on assessment of economics of options for minimizing and controlling the use of mercury, including impact on land contamination (for example use of retorts in case of mercury in ASGM) to reduce its impacts or to discourage the use of mercury and promote acceptable alternatives (such as mercury free technologies) without impacting the livelihood and employment opportunities of ASGM. This component will also look into the ways to reduce the impact (releases of POPs) of open burning of e-waste and solid waste in unregulated landfills and to addresses economic, environmental and social issues both at country level as well as at regional level. While recognizing that the risks of exposure, scope of regulations and capacity of enforcement and environmental health consequences of poor management of mercury and waste may vary among countries, attention would be paid to develop shared institutional approaches and solutions that could be replicated across the region for eliminating harmful chemicals and hazardous waste, focused on reducing overall environmental health implication.

Incremental cost reasoning and expected contributions from the baseline, the GEFTE, and co-financing:

- 45. The EHPMP for the Africa region will provide incremental funding across the suite of project interventions financed by IDA** in environment, urban and mining sector that focus on supporting improved capacity for effective pollution management. With so many interested and active stakeholders (governments, NGOs, multilateral banks, bilateral agencies, etc.), the proposed program will have a significant challenge but at the same time an incredible opportunity to finding an effective way to harness and optimize the delivery of diverse energies and investments. The proposal is grounded in the Stockholm Convention on POPs and the Minamata Convention on Mercury for which the GEF is the financial mechanism, and informed by various other related multilateral environmental agreements and global processes.
- 46. The GEF funding will be used to improve and consolidate the enabling environment necessary for technical assistance to support institutional strengthening and capacity building as well as knowledge, policy dialogue and regulatory enhancement to generate greater awareness of the impacts, including the health impacts of harmful chemicals and hazardous waste related to the release of POPs and mercury.** The co-financing from the WB through IDA, DGF and EITI funding, as well as Government from participating countries would focus on investment to demonstrate application of technological tools and

economic approaches for reduced environmental health risks due to POPs, mercury and other harmful chemicals and waste.

47. The proposed project (under components 1 and 2) will generate strengthened communication to policy makers at the national level so that sound management of harmful chemicals and hazardous waste is fully integrated into national budgets and sector level plans. Efforts would be made to target negotiators and policy makers in the selected African countries recognizing the cross cutting nature of sound management of chemicals and wastes in different sectors and its inherent impact on a sustainable future for all. The EHPMP targets not only the ministries of environment but other sector ministries such as Ministry of Mines, Ministry of Industries and Ministry of Urban Development that are responsible for planning, finance, industry, technology, innovation, health, women, children, and labour. This shift would systematically increase the visibility of these issues using assessments of the social and environmental costs of mismanagement of chemicals and waste including the impact on the productivity and health of impacted communities. The policy dialogue (under component 2) will focus on shifting the allocation of resources from national budgets, and increased participation and contributions from the private sector to allow GEF interventions to be sustained after the projects and programs are completed. The GEF program is expected to become a true catalyst for sustainable and sustained behavioural change.

Global environmental benefits

48. **The proposed program is one of the first integrated attempt to assist African countries** develop strategies and plans to ensure long term sustainability of actions at reducing significantly the risks of exposure to harmful and toxic chemicals and hazardous waste, such as mercury, e-waste and POPs. The project will thus provide appropriate technologies and alternative options for the environmentally sound management of mercury and hazardous waste, leading to their and POPs release reduction.

49. The Program directly contributes to GEF Corporate Result #5 *Increase in phase-out, disposal and reduction of releases of POPs, ODS, mercury and other chemicals of global concern*. While the cost-benefit of the proposed interventions, with an emphasis on long-term capacity building, is not easy to assess, it will be further analysed during project preparation and estimates presented for each child projects at CEO endorsement. For POPs, in line with GEF-6 Programming Directions for Chemicals and Waste and with Stockholm convention obligations, global environmental benefits from the Program will accrue from release reduction of unintentionally produced POPs, preliminary estimated at 12gTEQ/year using the UNEP toolkit, as well as release reduction of brominated flame retardants, to be further quantified during preparation of the child projects. The proposed program, with GEF incremental funding and co-financing, seeks to deliver global environmental benefits mostly through better waste management, including e-waste, leading to reduction of releases of UPOPs and brominated flame retardants, which represent priorities for the participating countries, and is aligned with Stockholm convention obligations and guidance to the GEF. As noted above, the program and child projects will be developed and implemented in line with the provisions under Articles 5 and 6 of the Stockholm Convention, and related guidance. Regarding mercury, while there too the emphasis is on long-term capacity-building, preliminary estimates point to a reduction of mercury use of 75 tons per year enabled through project interventions.

50. The programmatic design is based on technical advances in the sectors of focus in the Africa region, opportunities for institutional level collaboration across the region and putting together a comprehensive financial package under one umbrella, to ensure cost effectiveness and also given the GEF resources made available for each country. Further the program draws a balance between efforts on improving the enabling environment and pilot demonstrating technologies, particularly since this pilot regional effort is seen as the first step towards demonstrating the feasibility of the program for future scale up. Against this background and based on the requests from the countries, larger focus has been on making the enabling environment robust. The focus on upstreaming capacity building that includes assistance to strengthen policy, regulatory and institutional aspects under the project far outweighs the demonstrative investments, therefore relatively lower target/commitment on quantitative targets.

Innovation, sustainability and potential for scaling up:

51. Environmental sound management of harmful chemicals and waste in urban cities and in ASGM is a critical issue in most African countries due to the lack of technical, financial and managerial capacity to demonstrate results on the ground, and set up institutional mechanisms to promote innovative techniques, practices and approaches for the elimination and reduction of harmful chemicals and waste. Poverty and lack of alternative livelihood opportunities also attract a large percentage of rural poor to ASGM. This program approach aims to reduce environmental health issues through an innovative regional collaboration and aims to build awareness and understanding of the public health risks and environmental pollution to participating African countries. The regional partnership **is aimed at recognition of the need for a common platform to assess the legal and regulatory frameworks to address common issues such as cross-border and illegal movement of mercury and novel approaches.** The objective is to formalize the informal ASGM sector, empowering the rural poor and provide them with cleaner and simple technologies so as to address the drivers of mega-trends of global environmental degradation in an integrated and sustainable manner. It is expected that demonstrative projects in some countries can then be replicated in other countries.

52. **Innovation:** Innovation would be based on an integrated approach that would look at projects and initiatives to improve solid waste management and electronic waste through a development of area based approach towards environmental improvements and capacity building to reduce the environmental health risk. Interventions will not simply focus on a single issue or site, but rather on the mechanisms and underlying enabling conditions that influence the incentives for pollution management.

53. The program is designed to also assess and lay the groundwork for ensuring that technical assistance and investments are supporting truly green growth through for instance the development of waste to wealth activities and enhancing the region's ability to deal with the issues related to the handling, recycling and management of e-waste. The GEF PFD will support studies to analyze the growth in ICT and in e-waste following a 'life cycle' approach and recommend solutions in moving from a post-problem 'clean up' approach to a value-added approach that supports building a healthy, sustainable industry which can

create an impressive range of positive impacts on the national, regional and global levels. In order to achieve transformational change and be effective in an Africa-wide regional market, the interventions under the proposed GEF program will seek closer integration with global supply chains, e.g. related to illegal trade in mercury (for the Artisanal Gold Operation) that crosses national borders.

54. Sustainability: This Program will innovate across technology, finance and governance pillars to address environmental health risks. Using an integrated approach, the Bank will work in collaboration with other key donors and interventions to shift the baseline for pollution management such that the risks of noncompliance will outweigh potential rewards of inaction. Building good policies, strong legislation and the capacity to implement strong institutions across the waste management chain will establish the enabling environment for long term sustainability of improved pollution management by all stakeholders. Securing alternative development pathways that rely on enhanced commercial value of reclaimed land and associated community benefit due to reduced environmental health risks. The project will seek to create stable situations on the ground where there is proper enforcement, along with local communities affected by localized pollution, that generate local benefits while generating regional environmental benefits.

55. Potential for scaling-up: The Program will catalyze different innovations across its child projects that can be deployed at speed and scaled up across all African countries. A particular focus on demonstrating institutional models and establishing technoeconomically sustainable solutions will allow for causality to be established and will allow for smarter investment going forward, which in turn can tap new streams of finance that are results based. The demonstration pilots in the child projects will focus on stakeholder engagements, with a view to lay ground for support to more interventions with specific community level groups in the follow-up interventions. The appropriate policy and institutional models to be established under the program will crowd-in investment going forward and ensure that future interventions can be more effective, accelerate delivery and results, and avoid mistakes.

Stakeholders: Will program design include the participation of relevant stakeholders from civil society and indigenous people? (yes /no) If yes, identify key stakeholders and briefly describe how they will be engaged in program design/preparation:

56. Stakeholders and design. The program requires involvement and collaboration of multiple stakeholders from government (including ministries of environment, mining, and urban development), private sector and non-governmental organizations. The program will also work closely with the RECs and the AU, and with partners such as UNDP, UNEP and UNIDO, as well as organizations such as NRDC and Artisanal Gold Council, who have undertaken significant work in many of the countries. The benefits of this multi-stakeholder approach far outweighs the costs in providing for long-term sustainable approaches. With all these issues, the Ministry of Environment has a key regulatory role as well as being the focal point for the relevant convention, but limited leverage. The program can ensure that the dialogue is brought to the relevant sectoral ministries, and with the ministry of finance. The program envisages a regional partnership to foster strategizing and planning at a regional level, while simultaneously supporting local actions that prevent fragmentation of approaches. Such a regional approach will support strengthening of legal and regulatory

frameworks to address common issues such as cross-border and illegal movement of mercury or clean technology innovations, while promoting knowledge and experience sharing. Sectoral working groups will be convened focusing on the technical aspects of specific subjects such as eWaste or ASGM. A Technical Advisory Committee including donor partners will be set up to support child projects development, and coordinated implementation.

57. The development of the child projects would involve significant consultation with stakeholders at each country level as well as at regional level. The investment, institution and information ideas proposed under the program have been discussed in a high level round table with various interested countries, namely, the Governments of Ghana, Tanzania, Zambia, Senegal, Kenya and with the USEPA, NRDC, UNIDO, industry associations, and Non-Governmental Organizations. The EHPMP will also work closely with community-based organizations, private sectors, NGOs and local communities, who are invested in pollution management issues, including opportunities for income generation and green job opportunities. This engagement will go beyond consultation to actively involve communities in the design and implementation of child projects and in the learning across the Program. Special attention will be given to ensure the participation of indigenous people and local communities at the site level. It has been obvious that indigenous and local communities play a crucial role in environmental governance as traditional knowledge and practices can be used to manage and preserve natural areas as well as restore polluted or contaminated areas.

Gender Consideration. *Are gender considerations taken into account? (yes /no). If yes, briefly describe how gender considerations will be mainstreamed into program preparation, taken into account the differences, needs, roles and priorities of men and women.*

58. **An estimated 30% of world's artisanal miners are women** who occupy a number of roles ranging from labor-intensive mining methods to the processing aspect of artisanal mining, and thus this program presents an opportunity to provide a rationale and strategy for women to maximize potential benefits from participation in the sector. It has been well documented that inequities in political power, distribution of income, capital assets, and access to education and information have resulted in the increased susceptibility of women to chronic poverty. Despite the diverse and important roles undertaken by women in artisanal mining, limited reliable information is available on this topic. Consistent with the GEF Policy on Gender Mainstreaming and the GEF-6 approach on gender mainstreaming and World Bank Group's renewed Gender Equality strategy, the proposed program recognizes the gender dimensions of chemicals. The project will undertake gender analysis as part of the socio-economic assessment and highlight best practices in mainstreaming gender in chemicals and waste management projects. The project aims to raise awareness about the linkages between harmful chemicals and hazardous waste exposure, human health, environmental threats, and gender differences in risks and impacts. Gender considerations would be integrated as part of policy dialogue (under component 2) to ensure that women's and men's, concerns and experiences are taken into account in the design, implementation, monitoring and evaluation of environmental health implications.

59. **Women and children are often involved in mineral processing activities ranging** from crushing, grinding, sieving, washing and panning, to amalgamation and amalgam

decomposition. It is estimated that about 4.5 million women and 600,000 children work in ASGM (Veiga et al., 2003), while many additional women and children participate in non-mining related activities in close proximity to mining operations that utilize toxic substances such as mercury and cyanide.¹¹ Women typically play a much larger role in artisanal mining than in the large scale mining sector and the percentage of female artisanal miners is relatively high in Africa (see table below). As processing activities are often conducted in the home, women and their families can be at great risk from mercury poisoning and silicosis.

Table: Women in Artisanal Mining in Selected Countries¹²

| Country | Number of Women | Proportion of Women |
|----------|-----------------|---------------------|
| Ghana | 89,500 | 45 |
| Tanzania | 137,500 | 25 |
| Zambia | 9,000 | 30 |

60. Atmospheric pollution due to burning and dismantling activities of electrical/electronic waste is one of the significant causes for occupational exposure and contamination of neighbouring communities. Combustion typically generates smaller particles and consequently, fine particulate matter (PM2.5, strongly implicated in pulmonary and cardiovascular disease). Scrap yard workers are also exposed to PBDEs and dioxins associated with these fine particles. Among the direct and indirect exposed groups to PM2.5, PBDE and dioxins, the more vulnerable are pregnant women and children. Electrical/electronic waste specifically affects women’s morbidity/mortality, and fertility, as well as the health of any children. Of the 14 general types of hazardous chemicals commonly found in e-waste, more than half affect women’s general reproductive and endocrine functions. Women exposed to environmental toxins such as dioxins, flame retardants, PCBs, heavy metals and phthalates may suffer from anemia, fetal toxicity, hormonal effects, menstrual cycle irregularities, endometriosis, autoimmune disorders, and cancers of the reproductive system.

61. The main approaches to support women’s roles and health in the ASGM and recycling (from dumpsites and from electronic waste) sectors, would include addressing the associated environmental health risks. This would require increased and targeted communication and awareness of the risks associated, building capacity and supporting in adoption of clean technologies (e.g. training, small loans to purchase equipment and protective gear). Women who occupy administrative positions at artisanal mine sites (e.g. as bookkeepers) and spouses may also be in a position to advocate better practices. The EHPMP could also consider implementation of targeted training programs to train women in various aspects of mining and recycling as well as in marketing, management and

¹¹ Drace K. et al., (2012). Mercury-free, small-scale artisanal gold mining in Mozambique: utilization of magnets to isolate gold at clean tech mine, *Journal of Cleaner Production* 32 : 88-95

¹² Women and Artisanal Mining: Gender Roles and the Road Ahead: Jennifer J. Hinton, Marcello M. Veiga, Christian Beinhoff, 2003

bookkeeping, including encouragement of gender mainstreaming in lending institutions to support micro-finance opportunities.

Benefits. Describe the socioeconomic benefits to be delivered by the program at the national and local levels. Do any of these benefits support the achievement of [global environmental benefits](#) (for GEF Trust Fund) and/or adaptation to climate change?

62. The EHPMP focuses on addressing environmental health risks related to harmful chemicals and waste management. Doing this will have immediate and longer term socio-economic benefits for local communities, local and national revenues, and international trade in chemicals (such as mercury) and waste (such as e-waste and recyclable waste material). **There are significant health costs associated with poor chemical and waste management practices.** For example ground water contamination resulting from leaching of chemicals is reported to cause significant health costs. Improving pollution management of contaminated land will reduce the health risks through better management of run-off which could be a source of contaminated drinking water resources. Local and national treasuries benefit in two ways: first, increased revenues from reclaimed contaminated land that could be put for a more productive use; and reduced health costs of pollution. WB and GEF through various partner organizations have been involved in several programs and projects in the Africa region to enhance the socio-economic benefits for mining communities as well as reduce the associated environmental health implications due to use of mercury in artisanal and small scale gold mining. The pollution management program will benefit Artisanal and small scale gold miners by reducing their exposure to chemical contaminants- ASGM is a significant contributor to employment and poverty alleviation in many African countries, such as Tanzania, Ghana and Zambia. **For example estimates of the number of artisanal and small-scale miners in Tanzania range from 500,000 to 1.5 million. The government has estimated that small-scale mining generates at least three jobs for each individual directly involved. National gold exports reached US \$1.076 billion in 2009, up from US \$932.4 million the previous year** – including all large, medium, and small-scale mining operations. Artisanal and small scale gold mining may account for approximately 10% of Tanzanian gold production, though most of the small-scale mining activities are currently informal (i.e., not licensed officially).
63. While recycling of e-waste and recyclable waste material has driven employment and stimulated economic growth in the recycling sector, its informal and unregulated processes in most African countries are a source of groundwater contamination, atmospheric and water pollution as well as health problems including occupational safety impacts among those directly and indirectly involved. This is due to the **poor and unsophisticated methods of processing the waste, including uncontrolled burning, and disassembly resulting in release of toxic emissions containing POPs** such as UPOPs and flame retardants like polybrominated diphenyl ethers (PBDEs) and hexabromocyclododecane (HBCD), and polychlorinated biphenyls (PCBs). The program will lead to improved socio-economic condition of the affected communities living near the chemically contaminated hotspots and those working in e-waste recycling and open-waste dumpsites in targeted countries. Regular monitoring of impact at local and national levels will inform the successful implementation of the program, particularly about the additional resources or modified institutional approaches needed to address the environmental health issues for the local affected population. The EHPMP is designed to provide support to regulatory

institutions, sector ministries, municipalities as well as the local communities living next to contaminated areas. The program will provide benefits to regulatory and sector institutions, through capacity building, trainings, equipment, tools and regional partnerships.

Risks. *Indicate risks, including climate change risks, potential social and environmental future risks that might prevent the program objectives from being achieved, and if possible, propose measures that address these risks to be further developed during the program design:*

- 64.** Given the substantial political and governance risk, as well as substantial macroeconomic and sector risks, weak institutional capacity and project complexity, the risk rating for the achievement of the program objectives is assessed as High.

Key Risks and Issues:

- 65. Political and Governance: Substantial.** While the participating government of Zambia, Ghana, Senegal, Tanzania and Kenya are currently committed to poverty reduction through economic development of mining and urban sector, as well as minimizing environment health implications due to exposure to toxic chemical contamination, the political instability and political transition could create political resistance, reduce their commitment, and slow down implementation. Uncertainty regarding political and governance systems and high degree of instability can undermine the project's development objective. The project requires long term commitment based on project agreements and avoiding changes in mining laws that materially affect the project.
- 66. Mitigation measures:** The Bank has developed close relationship with the main stakeholders of the mining, urban, finance and environment sector and supported the convergence of the main political parties towards a common commitment to sustainable mineral and urban sector development.
- 67. Institutional Capacity for Implementation and Sustainability: Substantial.** The lessons from earlier and ongoing engagement in participating countries inform that the institutional capacity and coordination would be key aspects of program risks. The Bank would draw lessons from its considerable experience in the region to substantially enhance expertise in planning, implementing and monitoring of pollution management efforts. However, key risks remain due to its nature of ownership that will need to be further strengthened, including working with and educating communities. The regulators such as ZEMA in Zambia and NEMA in Kenya lack capacity to fully enforcing environmental regulations and ensuring compliance. The financial situation and institutional capacity of environmental regulators could be a key risk for the viability of the program. There is a risk of delay in the implementation of the program and due to coordination and capacity issues
- 68. Mitigation measures:** The Environmental regulations in participating countries adequately address environmental compliance issues, and thus no major policy reform is envisaged. However, significant capacity building efforts are planned to improve the capacity

particularly focused on identification of key environment health risks; establish feasibility and improve monitoring and reporting of environmental quality of the contaminated areas. The program will also help to update regulatory dispositions so that they have a significant deterrent impact on polluters, as well as provide a sufficient source of revenue to regulatory bodies. Finally, the project will help establish a mechanism to ensure cooperation between environmental regulators and the sector ministries such as mining and urban. More specifically, compliance requirements would not be limited to mining and urban regulations, but would also include other concerns when relevant, such as water, energy, transport or local government.

69. Stakeholder: Substantial. There are several financing partners, including NGOs, bilaterals and UN agencies, working towards minimizing the environmental health implications of chemicals and waste in Africa, with uneven understanding of risks, impacts, linkages and approaches to address the problems mentioned in this proposal. The proposal recognizes that there is a risk that consensus might not be reached and that due to limited resources all the stakeholders might not be able to be consulted at all time. To mitigate this risk, additional consultation processes will be built in within the national child projects and the regional project.

70. Mitigation measures: The program aims to develop and implement activities in a highly consultative manner. The design also includes developing a regional platform for discussing transboundary issues and common concerns faced by the various Governments. The involvement of Regional Economic Communities would also strengthen the regional collaboration and cooperation, through increased discussions of issues related to chemicals usage and trade and waste management.

Environment and Social Safeguards

71. It is anticipated that the program will have high environmental and social risks, with some large scale impacts and therefore it is proposed that the project be assigned Environmental assessment Category A. As majority of the program activities will be identified during implementation, the program will use a framework approach to safeguards management and prepare a comprehensive Environmental and Social Management Framework (ESMF) that would provide procedures for site specific Environmental and Social Impact Assessments (ESIAs) and Environmental and Social Management Plans (ESMPs). It is proposed that a Resettlement Policy Framework (RPF) also be developed to account for any possibility of temporary relocation during investment works and small-scale land acquisition. For those investments that will be undertaken in year one, which will have their designs finalized during preparation, site-specific ESIAs and Resettlement Action Plans (RAPs) will be prepared, consulted and disclosed before project appraisal. Specific applicable safeguards policies will be identified during project preparation.

Design risk

72. The problem of mitigating environmental health risks due to use and disposal of harmful chemicals and hazardous waste is very complex. The risks of impacting livelihood of people involved in illegal disposal of harmful chemicals and hazardous waste and upsetting entrenched business interest will be considered in program design. The program will be

designed using the best intelligence and experience to date to address this risk and will be very explicit about all the risk in the final design.

73. The overall rating is Substantial. The complexity of the problem and the fact that an ambitious program is required in the long run makes the risk substantial. The team has taken efforts to lowering this risk by ensuring that this program is very well consulted and designed. The program's success will be ensured by the Bank through regular incorporation of the opinion of experts as well as the political commitment by national governments.

Coordination. *Outline the institutional structure of the program including monitoring and evaluation coordination at the program level. Describe possible coordination with other relevant GEF-financed projects and other initiatives.*

74. The World Bank, as an Implementing Agency for the program will "ensure coherence of the Program and will be responsible for coordinating all aspects of the Program preparation and implementation". The World Bank will be responsible for all enquiries regarding Program preparation and implementation progress and Program-level reporting, mid-term evaluation, final Program completion and the achievement of Program-level impact on the global environment. It will make use of the Regional child project for financial and technical resources to achieve coordination and exchange of experiences, especially when there is more than one country-based project and when regional and global activities complement the investments at the national level.

Knowledge Management. *Outline the knowledge management approach for the program, including plans for the program to learn from other relevant initiatives, and to assess and document in a user friendly form, and share these experiences and expertise with relevant stakeholders.*

75. The EHPMP will apply a multi-pronged approach to knowledge management, as follows:

- Piloting environmental improvement through demonstration of cleaner technologies in small and abandoned artisanal gold mining sites. This will be done using a stringent methodological framework including site assessment, conceptual models and detailed environmental improvement plan based on future land use requirements. The lessons learnt and frameworks adopted will be shared across the countries and also disseminated at regional workshops.
- A focus on collating lessons across the Program. This will involve capturing lessons across the portfolio through formal knowledge management platforms that will occur annually and will include representatives from each child project, and producing knowledge management products that will be disseminated.
- A focus on learning lessons from outside the Program. This will involve working with external partners to capture their lessons and incentivizing child projects to replicate and scale up best practice.

National priorities. *Is the program consistent with the National strategies and plans or reports and assessments under relevant conventions? (yes /no). If yes, which ones and how: NAPAs, NAPs, NBSAPs, ASGM NAPs, MIAs, NCs, TNAs, NCSA, NIPs, PRSPs, NPFE, BURs, etc.*

76. The activities planned under EHPMP are consistent with the national requirements of the participating countries under the Stockholm Convention and the Minamata Convention. The Program will support participating country priorities, as outlined in their NIPs, for implementation of the Stockholm Convention which requires parties to reduce the risks to human health and the environment arising from the release of Persistent Organic Pollutants “with the goal of their continuing minimization and, where feasible, ultimate elimination”. This program will support countries in meeting this obligation by financing activities for strengthening institutional and legislative arrangements and demonstrating application of technological tools and economic approaches in addressing environmental health concerns associated with unregulated urban dumpsites and electrical/electronic waste recycling sites which are significant emitters of POPs and UPOPs.
77. With regards to the Minamata Convention, the program supports ASGM – a key Convention priority – and will be developed in a mutually supportive fashion with efforts underway of the participating countries to develop and implement a national action plan outlining national objectives and reduction targets, and actions to eliminate whole ore amalgamation, open burning of amalgam, as well as all burning of amalgam in residential areas where many such activities take place in processing centers. Further details on national priorities and the efforts to develop NAPs will be included within the child project descriptions. The EHPMP will support countries to meet their obligations under the Minamata Convention countries and will support countries in promoting knowledge about risks associated with mercury, best environmental practices, and alternative cleaner technologies that are environmentally, technically, socially and economically viable. The child projects once designed will support rolling out the NAP recommended interventions.

The GEF Agency’s program (*reflected in documents such as UNDAF, CAS, etc.*) and Agencies comparative advantage for implementing this program:

78. The EHPMP is aligned with the World Bank’s goal of ending poverty and promoting shared prosperity by reducing environmental health risks and building resilience of the poor and vulnerable population. The proposed activities are also in line with the Africa regional strategy, which identifies reducing vulnerability and improving resilience as an important pillar to sustain the goals of ending poverty and promoting shared prosperity. In addition, recent feedback received from World Bank clients and stakeholders during the preparation of, the World Bank Group’s Environment Strategy, Toward a Green, Clean, and Resilient World for All: A World Bank Group Environment Strategy 2012–2022, explicitly indicate strong demand from many countries for increased support on pollution management and environmental health topics. The strategy considers both how growth can become more sustainable and how investing in the environment can stimulate growth. Addressing environmental challenges through improved pollution management and environment-related health outcomes would contribute an important element to an approach that seeks to help client countries to establish more prosperous, inclusive and resilient cities. The proposal will help strengthen aspects of environmental governance. Extractive resources play important role in Africa’s development. Experiences with many African countries indicate that public ownership and investment in minerals brings many actors together in order to protect their interest, which may often stand in opposition. For example companies try to maximize their profit, governments aim to achieve national economic growth and protection of public interest, while communities continue to struggle

to retain their livelihoods, surrounding environment and livelihood opportunities. The proposal to engage various players on addressing the environmental health implications of mercury in ASGM will demonstrate a need for collaborative governance that will center on their sustainable extraction, equitable distribution and utilization. The engagement will aim to bring state and non-state actors, who are benefitting from ASGM to work collectively to set out rules and processes to protect their individual and collective interest as well as manage and distribute the risks and benefits of economic activity. The World Bank's long-term engagement in programs such as the Africa Stockpiles Program has demonstrated that internationally coordinated efforts could lead to significant success in cleaning up and safe disposal of obsolete pesticides and prevent future accumulation. However, lessons from this initiative need to be integrated into national planning process for further identifying other harmful chemicals and waste, and minimizing the resultant environmental health risks from exposure to a wider set of chemicals hazards and risks.

79. The Bank will use its leverage to convene the highest levels of national governments, led by Ministry of Finance, to a common platform under the proposed program to help accelerate action toward follow-up investment priorities. The World Bank's comparative advantage is its ability to leverage resources, convene key stakeholders around the issue and lead a dialogue both at national and regional levels. The Bank brings its unique convening power to help elevate the policy dialogue to focus on shifting the allocation of resources from national budgets to meet Convention obligations and promote increased contributions from the private sector. This will allow GEF interventions to be sustained after the projects and programs are completed, building on the co-financing leveraged for this program from the WB through IDA funding (US\$ 240m).

Child Selection Criteria. *Outline the criteria used or to be used for child project selection and the contribution of each child projects to program impact.*

80. Child projects were selected based on on-going engagement and dialogue, including with a regional assessment on levels of environmental health risks associated with Mercury in ASGM and POPs in unregulated waste in sub-Saharan Africa. From the available information, several countries were identified where previous and ongoing programs and national initiatives have been developed targeting the same issues. The over-arching concept and evolution of this PFD, which attempts to pilot a regional approach, originated from extensive discussions with and feedback from the participating countries, including country specific assessments and reports which were undertaken by the WB under the GEF-funded MSP on: "Reducing Environmental Health Impact of Harmful Chemicals in Africa Region". Feedback from multiple client countries indicate that - a) the resources and opportunities provided through multiple conventions could have enhanced impact through an integrated approaches; and b) there is significant room for countries in Africa to collaborate and learn from each other on institutional, regulatory and financial aspects of reducing environmental health risks. The final selection of countries within this program is therefore based upon client demand and ownership, strength of baseline activities, and to certain extent geographic representativeness to allow for future scale up on projects in the sub- regions. The contributions from child project are expected to:

- Individually focus on designing and implementing national strategies and approaches to reduce the risks of exposure to harmful and toxic chemicals and waste, such as mercury, e-waste and POPs.
- Collectively form part of a regional coordinating effort focused on learning and providing a leadership platform to affect policy in areas critical reducing environmental health risks associated with mercury and e-waste.
- Secure co-financing from Governments to apply the GEF incremental funding as a nudge to their investments towards addressing mercury and e-waste management.
- Partake in sharing lessons and testing approaches for replication based on learning in other projects to increase program sustainability, bring more efficiency to the investments and avoid duplication of efforts.
- Support investments in a pilot activity in each country that may involve creating enabling environment for investment in infrastructure (i.e. at the municipal level) to support clean mining technologies, setting up e-waste management facilities, etc.
- Work and ensure coordination and synergies are realized at national and regional level with all GEF investments.
- Allow for additional child project will be considered for inclusion on a rolling basis and approved at each GEF council meeting with a revised PFD.

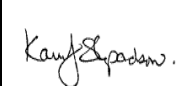
PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINTS AND GEF AGENCY

A. Record of Endorsement of GEF Operational Focal Point (S) on Behalf of the Government(S): (Please attach the [*Operational Focal Point endorsement letter\(s\)*](#) with this template.

| NAME | POSITION | MINISTRY | DATE (MM/dd/yyyy) |
|------------------------------------|---|---|-----------------------------|
| Julius Ningu | GEF Operational Focal Point. Director of Environment Vice President's Office (For Permanent Secretary) | VICE PRESIDENT'S OFFICE - TANZANIA | 07/15/2015 |
| Fredua Agyeman | GEF Focal Point - Director Ministry of Environment | MINISTRY OF ENVIRONMENT - GHANA | 07/02/2015 |
| Mr. Godwin Fishani Gondwe | Director/GEF Operational Focal Point Environment and Natural Resources Management Department for/ Permanent Secretary | MINISTRY OF LANDS, NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION - ZAMBIA | 07/09/2015 |
| Richard Lesiyampe ¹³ | GEF Operational Focal Point, Principal Secretary – State Department of Water, Environment and Natural Resources | MINISTRY OF WATER, ENVIRONMENT AND NATURAL RESOURCES - KENYA | 07/28/2015 |
| Mariline Diara | GEF Focal Point – Director of Environment for the Minister of Environment and Sustainable Development | MINISTERE DE L'ENVIRONNEMENT ET DU DEVELOPPEMENT DURABLE - SENEGAL | 09/21/2015 |

B. GEF Agency Certification

This request has been prepared in accordance with GEF policies and procedures and meets the GEF criteria for program identification and preparation.

| Agency Coordinator, Agency name | Signature | DATE (MM/dd/yy yy) | Program Person | Telephone | Email Address |
|--|---|---------------------------------|---|------------------|--|
| Karin Shepardson, GEF Agency Executive Coordinator |  | April 10, 2017 | Gayatri Kanungo GEF Practice Coordinator, Africa Region | 202-472- 0703 | gkanungo@ worldbank.o rg |

¹³ Operational Focal Point for Kenya since 2015-12-21 is Mr. Charles Talengo Sunkuli

LIST OF ANNEXES

ANNEX A: List of child projects under the Program and concept notes

ANNEX B: Technical annex with additional background information

ANNEX C: Overview of the use of electrical and electronic equipment and e-wastes in SSA countries

**ANNEX A: LIST OF CHILD PROJECTS UNDER THE PROGRAM AND OUTLINE
PROJECT CONCEPT NOTES**

The program is comprised of the following child projects which are inter-related in their scope and objective to integrate the issues related to harmful chemicals (e.g. mercury and POPs) into national and regional development programs. The national level child projects will all closely coordinate and engage regionally through the proposed regional coordination child project under this program. This regional coordination child project will additionally encourage other countries to engage and participate in the regional policy and learning events.

| Country | Project Title | GEF Agency | GEF Amount (\$) Project Total | Agency Fee (\$) | Total (\$) |
|----------------|--|-------------------|--------------------------------------|------------------------|-------------------|
| Tanzania | Reducing Environmental Health Risks in Artisanal Gold Mining Sector in Tanzania | WBG | 7,339,450 | 660,550 | 8,000,000 |
| Ghana | Reducing environmental health risks in artisanal gold mining and e-waste in Ghana | WBG | 8,715,596 | 784,404 | 9,500,000 |
| Zambia | Reducing Environmental Health Risks resulting from POPs releases in Solid Waste dumpsites in Kabwe, Zambia | WBG | 8,256,881 | 743,119 | 9,000,000 |
| Kenya | Reducing environmental health risks by improving management of electronic waste in Kenya | WBG | 8,073,395 | 726,605 | 8,800,000 |
| Senegal | Reducing Environmental health risks from the release of POPs and other toxic chemicals in Senegal | WBG | 5,504,587 | 495,413 | 6,000,000 |
| Regional | Coordinate action, knowledge and learning for reduction of environmental health risks from exposure to harmful chemicals | WBG | 4,311,927 | 388,073 | 4,700,000 |
| | Total | | 42,201,835 | 3,798,165 | 46,000,000 |

ANNEX A: **1. Tanzania**

PART I: PROJECT INFORMATION¹⁴

| | |
|-----------------------------|---|
| Project Title: | Reducing Environmental Health Risks in Artisanal Gold Mining Sector in Tanzania |
| Country(ies): | Tanzania |
| GEF Agency(ies): | WB |
| Other Executing Partner(s): | Ministry of Mines |
| GEF Focal Area(s): | Chemicals and Waste |

A. FOCAL AREA STRATEGY FRAMEWORK AND OTHER PROGRAM STRATEGIES¹⁵:

| Objectives/Programs (Focal Areas, Integrated Approach Pilot, Corporate Programs) | Trust Fund | (in \$) | |
|--|------------|-----------------------|-------------------|
| | | GEF Project Financing | Co-financing |
| CHEM-2 Program 4 | GEFTF | 7,339,450 | 50,300,000 |
| (select) (select) (select) | (select) | | |
| (select) (select) (select) | (select) | | |
| Total Project Cost | | 7,339,450 | 50,300,000 |

B. CHILD PROJECT DESCRIPTION SUMMARY

| Project Objective: Reduce Environmental health risks related to use of mercury in Artisanal Gold Mining Sector in Tanzania through strengthened institutional partnership and capacity. | | | | |
|--|------------------------------|---|-----------------------|--------------|
| Project Components | Financing Type ¹⁶ | Project Outcomes | (in \$) | |
| | | | GEF Project Financing | Co-financing |
| Institutional strengthening, knowledge and capacity building | TA | <p><i>Outcome:</i> Strengthened environmental monitoring by the Inspections office of Ministry of Energy and Minerals (MEM) and Vice President Office (VPO)</p> <p><i>Indicative targets:</i></p> <p>+ Improved effective monitoring of air, water and soil for mercury emissions</p> | 1,500,000 | 12,602,302 |

¹⁴ This Concept Note is intended to convey whatever preliminary information exists at this stage on a child project and that is indicative of how it will contribute to the overall Program.

¹⁵ When completing Table A, refer to the Program Results Framework, which is already mapped to the relevant [Focal Area Results Framework](#) in the [GEF-6 Programming Directbions](#).

¹⁶ Financing type can be either investment or technical assistance.

| | | | | |
|--|-----|--|------------------|-------------------|
| | | + Trained inspection officers including customs and border officers and communities | | |
| Policy Dialogue and Regulatory Enhancements | TA | <p><i>Outcome:</i> Enhanced Policy framework for management of mercury usage and disposal from ASGM sector</p> <p><i>Indicative targets:</i></p> <p>+Guidelines and checklists in place which are easily accessible and understood by small-scale miners</p> <p>Effective and wide-spread communication of the revised policy for small scale miners</p> | 1,500,000 | 12,500,450 |
| Demonstrating application of technological tools and economic approaches | INV | <p><i>Outcome:</i> Increased number of ASGM miners using non-mercury methods</p> <p><i>Indicative Targets:</i></p> <p>+Increased compliance with regulatory requirements related to ASGM formalization</p> <p>+ Reduction in mercury use (Ton/year)</p> | 3,972,477 | 23,362,384 |
| Subtotal | | | 6,972,477 | 48,465,136 |
| Project Management Cost (PMC) ¹⁷ GEFTF | | | 366,973 | 1,834,864 |
| Total Project Cost | | | 7,339,450 | 50,300,000 |

For multi-trust fund projects, provide the total amount of PMC in Table B, and indicate the split of PMC among the different trust

C. CO-FINANCING FOR THE PROJECT BY SOURCE, BY TYPE AND BY NAME

| Sources of Co-financing | Name of Co-financier | Type of Co-financing | Amount (\$) |
|---------------------------|------------------------|----------------------|-------------------|
| GEF Agency | World Bank | IDA Credit | 50,000,000 |
| Recipient Government | Government of Tanzania | In-Kind | 300,000 |
| Total Co-financing | | | 50,300,000 |

¹⁷ For GEF Project Financing up to \$2 million, PMC could be up to 10% of the subtotal; above \$2 million, PMC could be up to 5% of the subtotal. PMC should be charged proportionately to focal areas based on focal area project financing amount in Table D below.

D. TRUST FUND RESOURCES REQUESTED BY AGENCY(IES), COUNTRY(IES) AND THE PROGRAMMING OF FUNDS ^{a)}

| GEF Agency | Trust Fund | Country/ Regional/ Global | Focal Area | Programming of Funds | (in \$) | | |
|----------------------------|------------|---------------------------------|---------------------|----------------------|---------------------------|------------------------------|---------------|
| | | | | | GEF Project Financing (a) | Agency Fee (b) ^{b)} | Total (c)=a+b |
| World Bank | GEF TF | Tanzania | Chemicals and waste | Mercury | 7,339,450 | 660,550 | 8,000,000 |
| Total GEF Resources | | | | | 7,339,450 | 660,450 | 8,000,000 |

- a) No need to fill this table if it is a single Agency, single Trust Fund, single focal area and single country project.
- b) Refer to the [Fee Policy for GEF Partner Agencies](#).
- c) If Multi-Trust Fund project :PMC in this table should be the total amount; enter trust fund PMC breakdown here ()

PART II: PROJECT JUSTIFICATION

PROJECT OVERVIEW

A.1. Project Description. Briefly describe: 1) the global environmental and/or adaptation problems, root causes and barriers that need to be addressed; 2) the baseline scenario or any associated baseline projects, 3) the proposed alternative scenario, with a brief description of expected outcomes and components of the project, 4) incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing; 5) global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF); and 6) innovation, sustainability and potential for scaling up

Background

- 1. The Tanzanian gold mining sector comprises two subsectors:** the Large Scale Mining (LSM) subsector, which is associated with large FDI, infrastructure development, technology transfer, high productivity and high export earnings. Most of the mining sector growth has come from formal LSM which currently boasts seven gold mines. LSM tends to be highly capital intensive, and in the absence of strong backward, forward, and fiscal linkages with the rest of the economy, its contribution to job creation is limited. The second subsector is the Artisanal and Small-Scale Mining (ASM), and it often involves local miners using basic methods to extract near-surface deposits. ASM is associated with low investment, low productivity, and the use of informal marketing channels, but it accounts for most of the sector’s employment and is more accessible to the poor, especially in rural areas. However, because of the weak linkages between LSM and the local economy, particularly in rural areas, the socio-economic contribution has been sub-optimal. Tanzanians who do not enjoy a share of the LSM-induced urban prosperity are turning to the artisanal mining of small and medium-sized gold, copper, silver and other mineral deposits across the country as means of income generation and livelihood alternative during tough times. The mining sector is amongst the fastest growing sectors in several African nations and is the third largest producer of gold in Africa. The mineral sector remains critical to Tanzanian development, and has been an important contributor to the national economy despite fall in metal prices like gold experienced during the year 2013.

- 2. ASGM is a significant contributor to employment generation and poverty alleviation in Tanzania:** It is estimated that there are about 500,000 to 1.5 million artisanal and small-scale miners and the sector contributes approximately 10% of Tanzanian gold production. ASGM can be a traditional livelihood activity, a full-time source of employment, or a season specific part time job and can include migrant peoples, local communities with a longstanding history of mining, and people from all walks of life. There are rich diversities of labor practices and population demographics in Tanzania's ASGM sector. Many ASGM activities are carried out near or upstream of streams and rivers that drain into or are in close proximity to major freshwater impoundments such as lakes and manmade reservoirs created by storage dams for water supply, irrigation and hydropower. These impoundments act as sinks for mercury that accumulates in sediments and bio-accumulates in tissues of fish and other aquatic species. ASGM is carried out near major freshwater lakes such as Victoria, Nyasa, Rukwa and Tanganyika which are thriving sources of fisheries for export and local consumption. These freshwater bodies face real and growing risks of contamination if a government plan for managing mercury is not prepared and implemented in the near future.

- 3. Tanzania has signed the Minamata Convention on October 10, 2013.** Presently, Tanzania is considering the ratification in order to become a full party of the Convention. UNEP as GEF implementing agency is supporting Tanzania to prepare its MIA. This EHPMP will build on, and complement the ongoing MIA and NAP activities and will provide the opportunity for supporting further policy enhancements in small-scale mining, while building capacity for improving monitoring and enforcement of the regulations. While there is recognition that the use of mercury has serious environmental and health consequences, there are limited resources to demonstrate cleaner alternative technologies and also exhibit clean and feasible practices related to mine closure as mandated in the Mining policy.

Baseline scenario

- 4.** The environmental impact of ASGM activities is quite severe, as miners devastate the land by clearing and digging up vegetated areas. After an area is mined the land is left exposed and degraded, unsuitable for farming or any other activity. When the mining is carried out on hilly areas and slopes, severe erosion takes place and flooding can result. In certain locations miners not only remove vegetation and economically valuable trees but their activities also divert surface drainage. Siltation and mercury pollution in river systems is a common problem to be faced by communities living downstream. Mining activities expose communities to a wide range of diseases. Water collects and stagnates in the dug-out areas contributing to health hazards, potentially increasing the incidence of malaria and other water borne diseases. The most significant hotspot for ASGM activity is in the Geita District, situated near Lake Victoria in the Northwestern part of Tanzania. The population of artisanal and small-scale miners in Geita District is estimated to be 150,000, the majority of them unlicensed. Processing gold near rivers using amalgamation has been a practice for several decades for example in the Isingile River in Rwamagasa. A study of the Geita District estimated that 27 kg of mercury is released to the environment in the Rwamagasa area each year, while atmospheric emissions from other amalgamation burning is about 14 kg from the Blue Reef mine site and 7 kg from the other nearby mine sites including Nyakagwe and Nyamtondoi.

- 5. Currently, ASM accounts for roughly 10% of Tanzania’s gold production but accounts for a disproportionate share of employment** (over 90% of the gold industry’s total). It is also a significant source of gemstones, copper ore, iron ore, tin, bauxite, industrial minerals and building materials. The Ministry of Energy and Minerals (MEM) indicates that just under 600,000 people are officially working in the sector, but an estimated 1 million people are believed to be involved in this activity, including women and children, along the supply chain. The government has estimated that small-scale mining generates at least three jobs for each individual directly involved. However it involves informal arrangements and is associated with severe social, environmental, safety and security risks. Tanzania is the fourth largest Gold Producer in the World. Over the past three decades, the artisanal and small-scale gold mining (ASGM) sector in Tanzania has been increasingly important for poverty alleviation. Tanzania, Africa’s fourth largest producer of gold (after South Africa, Ghana, and Mali), is experiencing a boom in its mining industry. ASGM activities, taking place in many regions of the country, play a significant role both as a direct source of employment in mining communities and in generating additional jobs and revenues in the rural economy. Diverse types of mineral extraction are evident in Tanzania’s ASGM sector. Operations range from semi-mechanized and mechanized mining to the extraction of minerals using simple technologies with little or no economic capital and no mechanization. It is emphasized in studies that ASGM should be accorded careful regulatory attention, to address different types of mining operations and to ensure and improve their contribution to poverty alleviation and rural development. These activities involve gold production from both alluvial deposits and hard rock mining, and gold rushes have taken place in multiple regions of the country, especially in the area near Lake Victoria in the North. Rising international gold prices and closure of state owned mines forced people to move to ASGM.
- 6. ASGM has generally left a legacy of severe adverse (and irreversible) environmental health, economic, and social impacts**, often affecting disproportionately the poorest and most vulnerable communities. The ASGM industry is associated with the highest levels of mercury emissions, estimated at an annual average of 1,000 metric tons of inorganic mercury, about one-third of which is thought to go into the air while the rest winds up in piles of mining waste (“tailings”), soils, and waterways. Mercury pollution from ASGM is a part of the bigger global mercury pollution story, often travelling in aquatic ecosystems and expose downstream communities to methylmercury through diet. Mercury used in ASGM is mostly obtained illegally, posing a serious governance challenge. In 2011, it was estimated that 45 tons of mercury were used in Tanzania by around 500,000 small-scale gold miners, although the total amount of mercury imported officially was less than 2 tons, mostly obtained illegally from neighboring nations to extract gold with minimal protection. Approximately 25% of Tanzania’s 550,000 artisanal and small-scale miners are women, while women account for almost 50% of the 300,000 ASGM miners. A study of 166 children from ASGM areas in 3 countries, including Tanzania, revealed that children with the highest exposures had symptoms of mercury poisoning, such as excessive salivation, a metallic taste in the mouth, and abnormal reflexes. In addition, elevated mercury exposure was linked to ataxia, or coordination problems resulting from damage to the cerebellum¹⁸.

¹⁸ Mercury as a serious health hazard for children in gold mining areas. Böse-O’Reilly S, et al. 2008

7. The Bank commissioned a study to identify the possible hotspots for mercury contamination in Tanzania. **ASGM in Tanzania is concentrated in northern part and are mostly unlicensed.** Much of the recent gold mining boom in Tanzania has taken place in the **Geita District region, situated near Lake Victoria** in the North of the country. The population of artisanal and small-scale miners in Geita District is estimated to be 150,000, the majority of them unlicensed. A 2013 paper authored by three agencies (i.e. AGENDA, Tanzania), Arnika Association, Czech Republic and the IPEN Heavy Metals Working Group) examined levels of mercury in the hair of the population living and working at two critical ASGM sites **Matundasi and Makongolosi mining areas**. The study indicated that mercury contamination of the two sites can be directly linked to the gold ore amalgamation process using elemental mercury, as well as panning and open burning of mercury–gold amalgam in air without recovery systems. The results indicated that the mean mercury level in all 14 hair samples was more than 2.7-times higher than the US EPA reference dose of 1 ppm. Approximately two-thirds of the hair samples exceeded the reference dose. The maximum mercury value observed in a hair sample from Chunya District, Tanzania exceeded the US EPA reference dose by more than 13-fold. Another study looked at mercury levels in the breast milk of mothers living at ASGM sites and emphasized that 22 of the 46 children from these gold mining areas had a higher calculated total mercury uptake. The highest calculated daily mercury uptake of 127 μ g/L exceeds by far the recommended maximum uptake of inorganic mercury (Bose-O'Reilly, Lettmeier et al. 2008). Another study by Mnali (2001) observed high levels of mercury in stream sediments and tailings in the Lupa gold field.
8. **Rwamagasa Area in northwest and Lake Tanganyika in River Malagarasi sub-area:** Its proximity to Lake Victoria presents significant risks of mercury contamination. The level of mercury ranged from 0.01 to 0.03 μ g/L in the River Malagarasi and from 0.01 to 0.07 μ g/L in the Rwamagasa area. Many fish tissue samples from these sites fail export market standards (0.5 mg/kg) and also exceed the WHO recommended standard for the protection of health of vulnerable groups (0.2 mg/kg). Mercury in fish collected from the Nikonga River, approximately 25 km downstream from Rwamagasa, have low Hg concentrations. This suggests that the impact of mercury contamination on aquatic biota is relatively restricted, which is confirmed by the generally low mercury concentrations in drainage sediment and mbuga soils at distances more than about 6 km downstream of the main mineral processing area (or 'hotspot'). Typical symptoms of Hg intoxication were prevalent in the exposed group. For example, combining the medical score with the biomonitoring results made it possible to diagnose chronic Hg intoxication in 25 out of 99 amalgam burners, and in 3 out of 15 former amalgam burners. Significant correlations exist between Hg in urine and blood with the anamnestic score and between Hg in urine and the sum of all the anamnestic, clinical and neurological tests. It was shown that for the Rwamagasa amalgam-burner group, which is predominantly exposed to inorganic Hg (including Hg vapor), the Hg concentration in urine is a sound predictor for Hg intoxication.
9. **In recent years, legal and policy reforms oriented toward LSM resulted in significant improvements in the policy environment.** Tanzania became in 2014 “the most improved jurisdiction in Africa” in terms of policy environment. A new Mining Act 2010 was prepared to replace the Mining Act of 1998. The monitoring capacity of the Ministry of Mines has significantly improved. Processing of mineral licenses has also improved with the backlog being reduced by 85% and the number of mine audits has increased by 352%.

The specific objectives aimed at boosting the socio-economic benefits of mining for Tanzania and Tanzanians included: (i) establishing an enabling environment for Tanzanians to participate in ownership of medium and large scale mines; (ii) supporting and promoting development of small scale mining so as to increase its contribution to the economy; (iii) facilitating, supporting and promoting increased participation of Tanzanians in gemstone mining; (iv) establishing transparent and adequate land compensation, relocation and re-settlement schemes in mining operations; (v) strengthening involvement and participation of local communities in mining projects and encouraging mining companies to increase corporate social responsibilities; (vi) promoting and developing a marketing system of minerals to ensure that miners get right values of minerals traded in formal markets; and (vii) promoting and facilitating value addition activities within the country to increase income and employment opportunities. The World Bank is also supporting the proposed Mine Closure Policy under the SMMRP-II. The Mining Act also requires PMLs to prepare Environment Protection Plans which include the need for rehabilitating mines after closure. All PMLs are required by law to address environmental and social due diligence.

10. ASGM is spread across ten zones in special areas delineated and set aside by the government for the orderly development of the activity. Over the course of the last decade, the government has actively encouraged formalization of artisanal and small scale mining by simplifying procedures for acquiring PMLs and decentralizing the MEM inspections and extension services functions to zonal and district offices, and providing financial assistance to artisanal miners willing to formalize their operations. As a result of these efforts, PMLs have risen dramatically, increasing from about 35 in 1999 to nearly 26,000 in at the end of 2013. By the end of 2014, this number has further increased to 35,000. In 2013, the government established a small-scale mining loan facility of 6.4 billion Tanzanian shillings as a financial incentive to Tanzanians nationals operating as informal miners to register their activity and acquire primary mining licenses (PML) in areas set aside exclusively for ASM operations. Formal involvement by Tanzanian nationals through PML holding is now considered by the government to be an effective alternative for spreading the economic and social benefits of mining to a wider segment of the population.

Key lessons derived from ASGM sector analysis

11. **ASGM is a significant contributor to employment generation and poverty alleviation in Tanzania.** It can be a traditional livelihood activity, a full-time source of employment, or a season specific part-time job and can include migrant peoples, local communities with a longstanding history of mining, and people from all walks of life. Unplanned and unregulated ASGM has generally left a legacy of severe adverse (and irreversible) environmental, health, economic, and social impacts, often affecting disproportionately the poorest¹⁹ and most vulnerable communities. Studies have shown that the health of the miners and other people living within the area affected by mercury contamination may be negatively affected through inhalation of mercury vapor or contaminated dusts, direct

¹⁹ Most small scale miners are poor, who do not use any protective safety measures, therefore are exposed directly to contamination, such as from inhaling mercury.

contact with mercury, through eating fish and other food, and through the ingestion of waters and soils affected by the mercury contamination.

12. Presently, a MIA project is being prepared in Tanzania from the assistance of UNEP. The EHPMP will build on, and complement the MIA development process and provide the opportunity for supporting further policy enhancements in small-scale mining, while building capacity for improving monitoring and enforcement of the regulations. While there is a recognition that the use of mercury has serious environmental and health consequences, there are limited resources to demonstrate cleaner alternative technologies and also exhibit clean and feasible practices related to mine closure as mandated in the Mining policy. Tanzania, with a dynamic ASGM sector, has taken cognizance of this and is one of few countries in sub-Saharan Africa which have proactively taken preliminary steps towards regulatory and policy change in the mining sector, as outlined below.
13. ***Ease of obtaining mining titles/licenses has created an even playing field for ASGM:*** The 2010 Mining Act, which is the primary mining license, has been amended to include prospecting activities for small-scale miners and addresses licensing barriers by allowing long-term renewable licenses which can be processed at regional zonal offices. This levels the playing field considerably for artisanal and small-scale miners.
14. ***Key challenge is to ensure that “pit holders” are legally recognized to perform ASGM operations:*** It is widely known that “informal” leasing and transferring of mining titles is a common practice in many of Tanzania’s ASGM areas. Most owners of Primary Mining Licenses (PMLs) lease out the mineral access to pit holders who are a common feature in the organization of Tanzania’s mining communities. Formal contractual obligations between the PML owners, pit holders and workers are exceptionally rare, although sub-leasing of pits contradicts the mining legislation, Under the Mining Act, gold brokers are authorized to trade minerals within Tanzania provided they have a broker license issued by the Commissioner for Minerals, and licensed dealers are permitted to export gold. However, no laws govern the distribution of profits amongst claim holders, pit holders and mineworkers. “In Geita District the usual division of profits is around 30% for the workers and 70% for the claim holder,” though different assessments reflect diverse local profit sharing arrangements.
15. Negotiation with land owners and consultation with communities will minimize the adverse environmental and social implications of ASGM: The 1998 Mining Act and the 2010 Mining Act does not provide clarity in addressing compensation issues for surface land holders or other constituents, and the 2008 Bomani Commission report noted that the government needs to clarify compensation policies, procedures, and amounts for artisanal miners in cases where resettlement is an issue.
16. Legalizing transfer of rights and mining titles upgrades to artisanal miners will enhance responsibilities and entitlements of stake holders: The current Act does not provide specific legal stipulations on how sub-division of larger mining companies’ concessions could work in order to create legal possibilities for sharing land areas with artisanal and small-scale miners. Clarification of this dimension (formalizing of the subdivision of concessions) may be useful in the future, especially as government policy papers have recognized that more land needs to be allocated and available for legalizing artisanal miners.

17. *Environmental policy framework has room to include proper environmental management planning suited for artisanal miners:* Unlike large mining companies, owners of PMLs do not have to complete environmental impact assessments (EIAs). This has meant poor planning and monitoring of environmental compliance, particularly for the ASGM that could benefit from developing environmental guidelines and regulatory requirements to supplement existing Mercury Code.

Stakeholder Mapping

18. There are multiple stakeholders that would be critical for the success of the program. These are outlined below:

19. Role of Central Government agencies in formalizing small scale sector has been critical: Since the passage of the Tanzanian Mining Act in 1998, government authorities have emphasized that small-scale mining is a poverty-driven activity. As the Ministry of Energy and Minerals is the principal agent managing the development and regulation of this sector, its responsibilities have increased in recent years. The National Environmental Management Council (NEMC) deals with environmental issues. The Ministry of Finance oversees the allocation of the revenues collected by Tanzania Revenue Authority (TRA). The Ministry of Energy and Minerals conducts a range of permitting and monitoring functions, and coordinates the activities of the Zonal Mines Offices (ZMOs) and Resident Mines Offices (RMOs). Tanzania's Poverty Reduction Papers have drawn attention to the need for institutional support in artisanal and small-scale mining communities. However, due to budgetary limitations many of the extension services have been restricted in their scope and reach. Efforts to strengthen the capacities of the Ministry over the past decade have yielded important lessons.

20. The State Mining Corporation (STAMICO) complements the role of the Ministry of Energy and Minerals, particularly in professional mineral services, such as drilling, land and mine surveying mineral exploration, and investment promotion, and promotion and modernization of the ASGM sector. A widespread concern is that geological assessment processes have not yet benefited poorer groups of miners due to the primary focus on more modernized and formalized mining associations in the government programs to date.

21. Institutions at provincial and municipal level play the most important role for ASGM: An important recent institutional reform has been the decentralization of responsibilities in the permitting process for Primary Mining Licenses. In an effort to simplify licensing procedures for small-scale mining, the Ministry of Energy and Minerals now processes license applications and issues permits at the Zonal and Resident Mines Offices. This replaced the previous set-up where the license application, evaluation, and issuance process for all PMLs was based only at the Dar Es Salaam offices. In recent years, multiple policy advocacies have emerged to address the role of local village leaders with respect to exercising governance over different kinds of artisanal and small-scale mining.

22. Role of Miners' organization has been critical for ASGM but lack technical and financial resources: Informal and formal local organizations of artisanal and small-scale miners historically have played a crucial role in Tanzania. Diverse informal organizations exist among groups of pit holders, diggers, gold processors, and others at any given artisanal and small-scale mining site, even if they do not have licenses, and their capacity

to work together to address environmental health, safety, and wellbeing is vital for the success of the community. Knowledge exchange between different groups of miners' organizations has been an important strategy in generating lessons and sharing insights about organizational development, technologies, business practices, and livelihood challenges and solutions.

Analysis of Causality

- 23. Subsistence nature of ASGM and lack of alternatives masks the associated health hazards and environmental damage.** There are two issues which must be considered here, the first being recognition that most of these miners are not likely to give up ASGM due to its hazardous nature, given their subsistence existence and their priority to satisfy the needs of their households, often on a daily basis. Due to mercury's relatively low cost and efficiency, for the informal operator struggling to earn a daily wage, there are very few alternatives. The second issue concerns the alternatives themselves. As will be explained, there is a host of substitutes, along with devices capable of reducing emissions of mercury, available but the problem is systemic, requiring continuous enforcement, monitoring and training.
- 24. The severity and demographic distribution of mercury pollution from ASGM is difficult to inventorize due to its informality.** The paucity of demographic data and shortage of details about characteristics of activities make it difficult to pinpoint, with accuracy, the severity and geographical distribution of mercury pollution from ASGM. But from the scattering of information that has been collected over the years, a fairly illustrative picture can be constructed. As indicated, mercury's persistent usage is, in fact, a direct result of ASGM's informality. Driven largely by poverty, lacking security of tenure to mineralized sections of land and overly-dependent on middlemen, these ASGM operators are, understandably, preoccupied with earning a daily wage to feed themselves and their families. The key, therefore, is taking cognizance of these socio-economic issues and empowering individuals so they are able to think more dynamically about their activities, including issues related to mercury management.
- 25. Lack of security of land tenure has led to proliferation of illegal mining activities.** The policy and legislative frameworks implemented under the auspices of reform, over the past two decades have nourished the growth of informal ASGM across sub-Saharan Africa. Davidson (1993) was among the first to reflect critically on the issue, explaining that 'Governments must be prepared to move beyond the establishment of legal frameworks, to identify deposits and areas amenable to small-scale development, including the preliminary evaluation of their technical and economic viability at different levels of operation'. Legislation must be even-handed in allowing small-scale miners access to suitable land for prospecting and mining activities, especially if there is little incentive for small-scale mines to conform due to the low risk of being caught or of sanctions being applied.. It must be "user friendly" as far as the issuing of permits and the granting of licenses are concerned – permits that provide clear security of tenure for a reasonable period so that small-scale mining can become established. Much of the mining legislation enacted in African countries since independence envisages that 'small-scale mining' will be reserved for citizens or local companies while 'large-scale mining' will be the province of state mining corporations or large foreign mining companies.

26. Impact on ASGM Due to Prioritizing large-scale mine development. Evidently, the priority emphasis placed on large-scale mine development in the past has pushed ASGM to the margins. In what is a viewpoint shared by most donors and foreign investors, McMahon (2010) praises the approach taken to date to implement mining sector reforms, crediting them with bringing much-needed investment to the developing world. The author argues convincingly that ‘Given the relatively small size of the mining technical assistance loans—generally between \$10 million to \$50 million—they have had a phenomenal return when their impact is measured by the increase in investment’. The implementation of generous tax incentives, under reform, would certainly catalyze a steady stream of foreign investment across mineral-rich sub-Saharan Africa, but yielding a partitioned landscape, carved up and predominantly in the hands of foreign multinationals.

Proposed alternative scenario

Under the proposed program this child project will deliver at the national level and engage at the regional level through the regional coordination child project.

Component 1: Institutional strengthening, knowledge and capacity building

27. The Ministry of Energy and Minerals conducts a range of permitting and monitoring functions, and coordinates the activities of the Zonal Mines Offices (ZMOs) and Resident Mines Offices (RMOs). Since the passage of the Tanzanian Mining Act in 1998, government authorities have emphasized that small-scale mining is a poverty-driven activity and Tanzania’s Poverty Reduction Papers have drawn attention to the need for institutional support in artisanal and small-scale mining communities. However, due to budgetary limitations many of the extension services have been restricted in their scope and reach. This component will strengthen environmental monitoring by the Inspections office, ZMOs, RMOs and the National Environmental Management Council (NEMC). The component will assist in strengthening various institutional players involved in regulating mercury trade, such as customs/border control tax officials and business community. This component could include procurement of simple equipment for air, water and soil monitoring. Collaboration will also be made with STAMICO to put in systems for regulating the mercury trade, through steps required to implement the Minamata Convention. The objective of this component is to strengthen the institutional strengthening and capacity building for these institutions for managing the artisanal gold mining sector. This component will build capacity of these institutions and support development of guidelines and monitoring systems in place for management of mercury usage and hazardous waste in ASGM. Capacity building and institutional strengthening is expected to focus on multiple levels, such as the environmental regulators, mining policy makers, artisanal gold miners, and mining communities. The key areas of capacity building would include: strengthened monitoring of health and environmental indicators, compliance with mining and environmental regulation, public consultation with local stakeholders and disclosure of relevant information to mining communities, and maintaining an inventory consistent with the requirements of the Minamata Convention. In addition, the component will ensure both national level stakeholders coordination and participation in the regional learning and knowledge sharing activities on the harmful chemicals agenda. This will contribute to strengthening the regional partnerships and collaboration. This component will promote transparency along the whole value chain, offering greater opportunity for miners to have a direct access to the market in order to negotiate with the end buyer a better price for their gold, leading to greater economic and social stability.

28. The recently completed Mercury Trade Diagnostic study revealed the lack of transparency in import, use and disposal of mercury in ASGM sector. The following three lessons would be incorporated into Component 1 – (a) The policy and regulatory aspects of mining will be strengthened to include provisions for recognition of legal import of mercury. (b) A country level inventory and tracking of mercury import and use in the ASGM sector would be implemented as part of capacity building plan and (c) The artisanal miners will be trained to understand the cost-benefit analysis of producing mercury from illegal traders versus associated environmental health costs which does not get addressed due to non-transparent transactions. This supply chain of mercury and gold will include procurement of cheap and reliable source to mercury, access to credit and technical knowhow licensing, extraction and amalgamation; final gold sales and prices. Artisanal miners are expected to use these benefits to increase their organizational ability to trade responsibly, to respect and improve the lives of those who work with them, the communities in which they work and the environment.

Component 2: Support to policy dialogue and regulatory enhancements

29. The Government of Tanzania seems to be amending, fairly proactively, a legislative and policy framework that earlier did not address the needs of the small-scale miners. But whilst there is certainly a basic foundation for rapid ASGM formalization now in place, there is still work to be done to improve the legislations to address the sector-specific and mercury related complexities. One of the major changes in The Mining Act, 2010 was the addition of an Environmental Protection Plan (EPP) which, along with an ‘environmental investigation’ and ‘social study report’, must be submitted to the respective Zonal Mines Officer within four months of being granted a Primary Mining License. Holders must conduct baseline environmental investigations and propose ways in which possible environmental impacts will be mitigated. This component will support Government’s efforts in strengthening the current environmental policies and regulations and capacity to monitor; screen and evaluate health and environmental risks associated with ASGM. The component will assist development of strategy for promoting the reduction of emissions and releases of, and exposure to, mercury in artisanal and small-scale gold mining and processing, including mercury-free methods; Managing trade and preventing the diversion of mercury and mercury compounds from both foreign and domestic sources to use in artisanal and small scale gold mining and processing; Working with the ASGM miners at community level will be a key focus under this component, which will be accomplished through stakeholder engagement and mobilization, recognizing that artisanal miners are not homogenous and tend to operate in areas of high informality. Involving stakeholders in the implementation and continuing development of the national action plan; a public health strategy on the exposure of artisanal and small-scale gold miners and their communities to mercury; and more localized training of artisanal miners and stakeholders. Such a strategy would include gathering of health data, training for health-care workers and awareness-raising through health facilities. Assistance would be provided to prevent the exposure of vulnerable populations, particularly children and women of child-bearing age, especially pregnant women, to mercury used in artisanal and small-scale gold mining; and dissemination of information to artisanal and small-scale gold miners and affected communities, in support for the implementation of the National Action Plan.

Component 3: Demonstrating application of technological tools and economic approaches

30. This activity will support the drive of the Government of Tanzania to formalize the ASGM sector which will create incentives for artisanal miners to access relevant knowledge, financing and institutional support in line with Government's obligations under the Minamata Convention. Technical assistance under the program will help improve working condition for local mining community by leveraging planned investment activities under SMMRP-II to promote mercury abatement. The objective of this component is to collaborate with SEDCO or local manufacturers to manufacture/replicate low cost centralized mercury management equipment to enable moving away from individual retorts. This proposal will not only reduce the amount of mercury to be procured and used but also reduce the amount of mercury emissions and wastage thereby completing the MIA initiative for Tanzania which stated in its proposal that: "the project will not only reduce risks related to mercury exposure, as an initial assessment it will provide policy makers the tools and guidance needed to design and implement strategies for risk reduction". The demonstrative investments will be selected and designed on the basis of environmental health risks and cost effectiveness of interventions. The project will consider opportunity for climate change adaptation and mitigation, especially use of cleaner technologies, including non-mercury options as known in the ASGM sector, use of reclaimed lands, and mitigating effect of mining sectors on carbon sequestering ecosystems, such as forests. Such environmental improvements²⁰ will act as demonstration pilots for the PMLs who are mandated to rehabilitate their mines based on the Mine closure policy in the Mining Act. The objective will also enhance Government's policy towards appropriate land usage for pastoral and agricultural activities and strengthen community level monitoring, through involvement of communities and link to demonstrative investments.

Incremental/additional cost reasoning and co-financing

31. The World Bank funded *Sustainable Management of Mineral Resources project (SMMRP-II)* (about US\$50 million equivalent) aims "to strengthen the Government's capacity to manage the mineral sector, to improve the socioeconomic impact of large-scale and small-scale mining for Tanzania and Tanzanians and enhance private local and foreign investment." The project focuses on improving the benefits of the mineral sector (Artisanal and Small-Scale Mining and Skills Development) and strengthening governance and transparency in mining. This proposed GEF project will build upon the existing World Bank project (SMMRP-II) and work done by other partners (such as UNEP, UNIDO, HRW, NRDC, AGC), drawing synergies on the ground with other initiatives such as the UNEP Global Mercury Project in Geita District. The project recognizes the available guidance and analysis of barriers that needs to be addressed incrementally. Some of these barriers include regulatory gaps (being addressed under component 3) resulting from informal nature of ASGM sector, lack of access to financing (being addressed under component 2), poor awareness about environmental health risks and insufficient technical know-how among the artisanal miners (being addressed under component 1).

²⁰ The project recognizes that the Minamata Convention is still to develop international guidelines related to mercury site contamination. The Bank team will maintain dialogue with the Minamata interim Secretariat, and the participating country will use the emerging guidance where relevant – as well as being able to provide relevant input to guidance development based on their experience.

Global environmental benefits

32. Artisanal gold mining is actually the leading cause of global mercury pollution, and it has been documented that for every gram of gold produced, artisanal gold miners release about two grams of mercury into the environment. Together, the world's 10 to 15 million artisanal gold miners release about 1000 tons of mercury into the environment each year. Demonstrating cleaner technologies and providing miners with safe alternatives will have a direct benefit of not only reducing mercury emissions but the reduction in toxic fumes will have beneficial impacts on the health of the miners. Financial benefits also arise from better management of input, including mercury recycling. The savings in mercury point to the huge benefits that could be achieved by making such technologies an integral part of the small-scale mining process and also helping Tanzania to meet its obligations under the Minamata Convention. Training on safer alternative processing methods put the emphasis on health and economic benefits, which can be obtained by using cleaner technologies. This aspect becomes especially important in the absence of alternative livelihoods. Mandating and supporting ASG miners to rehabilitate closed mines will allow revegetation of large tracts of land, support reforestation efforts of the Government of Tanzania and in some cases allow land to be returned for productive agricultural or pastoral use.

A.2. *Stakeholders.* Will project design include the participation of relevant stakeholders from civil society and indigenous people? (yes /no) If yes, identify key stakeholders and briefly describe how they will be engaged in project design/preparation:

33. Informal and formal local organizations of artisanal and small-scale miners historically have played a crucial role in Tanzania. Diverse informal organizations exist among groups of pit holders, diggers, gold processors, and others and their capacity to work together to address environmental health, safety, and wellbeing is vital for the success of the community. Knowledge exchange between different groups of miners' organizations will be an important strategy in generating lessons and sharing insights about organizational development, technologies, business practices, and livelihood challenges and solutions. The key stakeholders include the Small-Scale Miners' Federation, the Women's Small-Scale Mining Federation (TAWOMA), Mwanza Regional Miners Association (MWAREMA), Federation of Miners Association of Tanzania (FEMATA) and selected Savings and Credit Cooperative Societies (SACCOS), along with identified local communities. The State Mining Corporation (STAMICO) will support with providing technical services. Special attention will be given to ensure the participation of indigenous people and local communities at the site level.

A.3 *Risk.* Indicate risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the project design:

| Risk Category | Rating and Risk Management |
|--|----------------------------|
| Sector Strategies and Policies | Moderate |
| Technical Design of Project or Program | Substantial |
| | |

| | |
|--|-------------|
| Institutional Capacity for Implementation and Sustainability | Moderate |
| | |
| Fiduciary | Substantial |
| | |
| Environmental and Social | Substantial |
| | |
| Stakeholders | Moderate |
| | |
| Overall | Substantial |

A.4. Coordination. Outline the coordination with other relevant GEF-financed and other initiatives:

34. The EHPMP will utilize and strengthen existing structures for national coordination to avoid duplication and to ensure coordination between the countries. Therefore, this program will build on, and complement the ongoing MIA, NAP and NIP activities in participating countries in partnership with other GEF Implementing Agencies, including UNIDO, UNDP and UNEP, which are implementing GEF projects on chemicals and waste and POPs.

- Integrated Health and Environment Observatories and legal and institutional strengthening for the Sound Management of chemicals in Africa (African ChemObs)
- Continuing Regional Support for the POPs Global Monitoring Plan under the Stockholm Convention in the Africa Region
- Enabling Activities to Review and Update the National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants
- Development of Minamata Convention on Mercury Initial Assessment in Africa
- Environmentally Sound Management of Municipal and Hazardous Solid Waste to Reduce Emission of Unintentional POPs
- Promotion of BAT and BEP to Reduce uPOPs Releases from Waste Open Burning in the Participating African Countries of COMESA-SADC Subregions
- Minamata Convention Initial Assessment in Francophone Africa
- Sound Chemicals Management Mainstreaming and UPOPs Reduction (Kenya)
- Improve the Health and Environment of Artisanal and Small Scale Gold Mining (ASGM) Communities by Reducing Mercury Emissions and Promoting Sound Chemical Management (Senegal)

B.1 Is the project consistent with the National strategies and plans or reports and assessments under relevant conventions? For biodiversity related projects, please reference the Aichi Targets that the project will contribute to achieving. (yes /no). If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, etc.:

35. The Minamata Convention requires countries to take steps to reduce, and where feasible eliminate, mercury use and releases. One of the primary actions to be taken is progress towards the reduction of mercury in ASGM. The GEF funded “Development of Minamata Convention on Mercury Initial Assessment” aims to support Tanzania with scientific and technical knowledge and tools for ratification and early implementation of the Minamata Convention and will be mutually supportive of this project.

ANNEX A: **2. Ghana**

PART I: PROJECT INFORMATION²¹

| | |
|-----------------------------|---|
| Project Title: | Reducing environmental health risks in artisanal gold mining and e-waste in Ghana |
| Country(ies): | Ghana |
| GEF Agency(ies): | WB |
| Other Executing Partner(s): | Ministry of Environment Science and Technology |
| GEF Focal Area(s): | Chemicals and Wastes |

A. FOCAL AREA STRATEGY FRAMEWORK AND OTHER PROGRAM STRATEGIES²²:

| Objectives/Programs (Focal Areas, Integrated Approach Pilot, Corporate Programs) | Trust Fund | (in \$) | |
|--|------------|-----------------------|--------------|
| | | GEF Project Financing | Co-financing |
| CHEM-2 Program 3 | GEFTF | 4,587,156 | 20250,000 |
| CHEM-2 Program 4 | GEFTF | 4,128,440 | 45,800,000 |
| Total Project Cost | | 8,715,596 | 66,050,000 |

B. CHILD PROJECT DESCRIPTION SUMMARY

| Project Objective: Reduce Environmental health risks related to use of mercury and open burning of ewaste in Ghana through strengthened institutional partnership and capacity. | | | | |
|--|------------------------------|--|-----------------------|--------------|
| Project Components | Financing Type ²³ | Project Outcomes | (in \$) | |
| | | | GEF Project Financing | Co-financing |
| Institutional strengthening, knowledge and capacity building | TA | <p><i>Outcome:</i> Improved and regular environmental monitoring and inspections</p> <p><i>Indicative Targets:</i> + Improved effective monitoring of air, water and soil for mercury emissions +Improved monitoring of open burning of ewaste</p> | 1,900,000 | 25,050,000 |

²¹ This Concept Note is intended to convey whatever preliminary information exists at this stage on a child project and that is indicative of how it will contribute to the overall Program.

²² When completing Table A, refer to the Program Results Framework, which is already mapped to the relevant [Focal Area Results Framework](#) in the [GEF-6 Programming Directions](#).

²³ Financing type can be either investment or technical assistance.

| | | | | |
|--|-----|--|------------------|-------------------|
| | | + Trained inspection officers including customs and border officers and communities | | |
| Policy dialogue and regulatory enhancements | TA | <i>Outcome:</i> +Policy framework for management of e-waste and mercury usage and disposal from ASGM sector <i>Indicative Targets:</i> +Guidelines and checklists in place which are easily accessible and understood by different actors | 1,900,000 | 10,000,000 |
| Demonstrating application of technological tools and economic approaches | INV | <i>Outcome:</i> +Increased number of ASGM miners using non-mercury methods; +Reduced environmental health risks from POPs releases <i>Indicative Targets:</i> +Increased compliance with regulatory requirements related to ASGM formalization + Reduction in mercury use (Ton/year) +Reduced open dumping and burning of waste + Reduction in POPs releases (UPOPs and PBDE) | 4,479,816 | 29,165,136 |
| Subtotal | | | 8,279,816 | 64,215,136 |
| Project Management Cost (PMC) ²⁴ GEFTF | | | 435,780 | 1,834,864 |
| Total Project Cost | | | 8,715,596 | 66,050,000 |

For multi-trust fund projects, provide the total amount of PMC in Table B, and indicate the split of PMC among the different trust

²⁴ For GEF Project Financing up to \$2 million, PMC could be up to 10% of the subtotal; above \$2 million, PMC could be up to 5% of the subtotal. PMC should be charged proportionately to focal areas based on focal area project financing amount in Table D below.

C. CO-FINANCING FOR THE PROJECT BY SOURCE, BY TYPE AND BY NAME

| Sources of Co-financing | Name of Co-financier | Type of Co-financing | Amount (\$) |
|---------------------------|--|----------------------|-------------------|
| World Bank | Extractive Industries Transparency Initiative (EITI) | Grant | 450,000 |
| World Bank | Ghana Local Government Capacity Support Project | Loan | 50,000,000 |
| World Bank | Urban Water Project | Loan | 15,000,000 |
| Recipient Government | Government of Ghana | In-Kind | 600,000 |
| Total Co-financing | | | 66,050,000 |

D. TRUST FUND RESOURCES REQUESTED BY AGENCY(IES), COUNTRY(IES) AND THE PROGRAMMING OF FUNDS ^{a)}

| GEF Agency | Trust Fund | Country/Regional/Global | Focal Area | Programming of Funds | (in \$) | | |
|----------------------------|------------|-------------------------|----------------------|----------------------|---------------------------|------------------------------|------------------|
| | | | | | GEF Project Financing (a) | Agency Fee (b) ^{b)} | Total (c)=a+b |
| WBG | GEFTF | Ghana | Chemicals and | POPS | 4,587,156 | 412,844 | 5,000,000 |
| WBG | GEFTF | Ghana | Chemicals and Wastes | Mercury | 4,128,440 | 371,560 | 4,500,000 |
| Total GEF Resources | | | | | 8,715,596 | 784,404 | 9,500,000 |

- a) No need to fill this table if it is a single Agency, single Trust Fund, single focal area and single country project.
- b) Refer to the [Fee Policy for GEF Partner Agencies](#).
- c) If Multi-Trust Fund project :PMC in this table should be the total amount; enter trust fund PMC breakdown here ()

PART II: PROJECT JUSTIFICATION

PROJECT OVERVIEW

A.1. Project Description. Briefly describe: 1) the global environmental and/or adaptation problems, root causes and barriers that need to be addressed; 2) the baseline scenario or any associated baseline projects, 3) the proposed alternative scenario, with a brief description of expected outcomes and components of the project, 4) incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing; 5) global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF); and 6) innovation, sustainability and potential for scaling up.

Background

- Ghana's economy is expected to slow down for the fourth consecutive year to an estimated 3.9% growth rate in 2015**, owing to a severe energy crisis, unsustainable domestic and external debt burdens, and deteriorated macroeconomic and financial imbalances²⁵. Despite significant progress towards most of the MDGs, the country continues to be challenged by MDG 4, reduce child mortality; MDG 5, improve maternal

²⁵ African Development Bank Group, 2015

health; and the sanitation component of MDG 7. One in six children age 6–14 are engaged in labor activities in Ghana, with child employment being the leading alternative to schooling, and child labor can also have adverse effects on children’s cognitive development by interfering with schooling and on their physiological and psychological development by increasing exposure to health hazards, particularly for those children involved in mining and agriculture²⁶.

Artisanal Gold Mining Sector

2. Ghana became signatory to the Minamata Convention on September 24, 2014. Presently, Ghana is considering the ratification in order to become a full party of the Convention. The EHPMP will build on, and complement the ongoing MIA and NAP activities and will provide the opportunity for supporting further policy enhancements in small-scale mining, while building capacity for improving monitoring and enforcement of the regulations. While there is recognition that the use of mercury has serious environmental and health consequences, there are limited resources to demonstrate cleaner alternative technologies and also exhibit clean and feasible practices related to mine closure as mandated in the Mining policy. Mining industry of Ghana accounts for 5% of the country's GDP and minerals make up 37% of total exports, of which gold contributes over 90% of the total mineral exports. Ghana is Africa's 2nd largest gold producer. Improved international economies and reduced spot prices of gold has had an immediate impact on Ghana’s gold production in the past couple of years. Additionally the falling gold prices and a government crackdown on illegal gold mining resulted in Ghana's output declining by 18%²⁷ in third quarter of 2013, impacting the livelihood of many rural miners²⁸ who have no education and have little alternative options. An estimated one million people are engaged in this industry and directly and indirectly depend on it for their livelihood. ASGM has the potential to contribute to poverty alleviation; however, it often perpetuates poverty through illness, physical hazards and accidents, lack of education/knowledge about more efficient, safer, and environmentally friendly techniques.
3. In Ghana, the single most important mercury emission source is from the ASGM sector. Other sources vary and include releases from discarded low energy bulbs, incineration of hospital waste and unsegregated household waste. In 2011, 19.26MT of mercury was imported into Ghana. In 2012, it dropped to 9.6 MT, dropping even further to 2.5 MT in 2013. (EPA, 2014) However, these figures do not necessarily equate to a drop in usage of mercury, as gold export from the ASGM sector has only been increasing year after year (1.4 million ounces in 2012, 1.0 million ounces in 2011 and 767,696 ounces in 2010). As no new technologies have really been introduced to replace mercury in the extraction of gold, there has to be other avenues available, i.e. black market. Veiga and Baker (2004) estimated that for every one gram of gold produced, in ASGM, one or two grams of Hg is lost. However, various authors also point out that this ratio is very variable dependent upon practice, and there are cases where it has been as much as 100:1. When this ratio is compared to the quantity of gold exported by the Ghanaian ASGM sector in 2012 (1.4 million ounces) it can be seen that approximately 30-60MT of Hg may have been lost to air, if the entire ASGM sector were using mercury for gold extraction. According to the

²⁶ Understanding child labor in Ghana beyond poverty: Alexander Krauss; World Bank June 2013

²⁷ Gold mining declining fast in Ghana – Africa's second largest gold producer. Mining.com, January, 2 , 2014

²⁸ BBC News Report Dec 2013

results of a survey conducted by Amegbey and Eshun (2003) on mercury use in ASGM in Ghana: 1) 70% is most often stored on site; 2) 90% is nearly always handled without gloves; and 3) 98% is typically heated in open air.

Electronic waste

4. Estimated to be the world's largest ewaste dumping site, Agbogbloshie in Ghana has an estimated 6,300 – 9,600 people working in the informal sector, with a dependent population of between 121,000 – 201,600. When the e-waste is burnt, toxic substances controlled under the Stockholm convention such as UPOPs are generated and PBDEs are released. Soil and ash samples from burning sites in Agbogbloshie showed copper, lead, tin and zinc concentrations over one hundred times higher than typical background levels. Concentrations of antimony and cadmium exceeded typical background soil levels by around fifty times for antimony and five times for cadmium²⁹. Burning of plastic covering and shielding from wires and coils creates substantial airborne emissions. Since most of recycling sites include extensive support facilities such as housing and food preparation, chemical exposure goes beyond workers. Soil samples indicate that the e-waste recycling and disposal process in Ghana has caused contamination that may have detrimental health. The rudimentary recycling has caused substantial damage to the health of scavengers and local environment. Leaching and evaporation of these toxic substances occurs at the e-waste sites and results in the contamination of surrounding natural resources including, soils, crops, drinking water, livestock and fish. Public awareness of the hazardous nature of eWaste is low and along with economic factors, results in the use of low end or crude waste management techniques which are highly polluting. Enforcement of regulations is also challenging due to the diversity and variety of ewaste streams, scattered sources, unregulated imports and the large informal workforce. Additionally, lack of reliable data (like inventory information on toxic substances like PBDEs production, importation and usage) difficulty in inventorisation) poses a challenge to design an e-waste management strategy and to an industry wishing to make rational investment decisions.

Baseline scenario

Artisanal Gold Mining Sector

5. In Ghana, an estimated **one million people are engaged in this industry** and directly and indirectly depend on it for their livelihood. ASGM has the potential to contribute to poverty alleviation; however, it often perpetuates poverty through illness, physical hazards and accidents, lack of education/knowledge about more efficient, safer, and environmentally friendly techniques. Some evidence does indicate that ASGM related mercury contamination, in Ghana, is contributing to **serious health, ecological, and economic impacts**. This undoubtedly keeps these ASGM workers trapped in a vicious cycle of increasing poverty, worsening quality of life, degrading and threatening natural resources, and vulnerability. The mining methods employed within the ASGM sector in Ghana are characterized into three groups: 1) shallow (alluvial) alluvial mining; 2) deep alluvial mining; and 3) hard rock (lode) mining.

²⁹ Ghana e-Waste Country Assessment: SBC e-Waste Africa Project; March 2011

6. Another issue in Ghana has been increasing **conflicts between gold surface mining concessions and local communities**. A study undertaken in 2011 indicated a massive erosion of the region's farming base and a widespread degradation and loss of ecosystem services that local communities depend on. Farmland loss was perceived as the major threat to people's livelihoods. Surface mining led to the direct loss of about 5,000 ha of farmland (representing about 5% of the district's total farmland), affecting an estimated 6.8% of the total agricultural labor force (total farmland and total agricultural labor force numbers are based on (Wassa West District Assembly 2004)). Deforestation due to surface mining was widespread, resulting in a loss of about 3167.6 ha (58% of all forests within concession areas).
7. Literature available on the toxicity of mercury to people involved with ASGM and, to a lesser extent, to the environment, has been well studied in Ghana. Clifford's (2012) research provided a comprehensive understanding of the dynamics of mercury use in Ghana's ASGM industry supported with qualitative and quantitative analysis and an environmental assessment of three study locations (Akwatia, Bolgatanga and Prestea). Nartey *et al.*, (2011) conducted a study to assess the level of mercury pollution in rivers and streams around artisanal gold mining areas of the Birim North District of Ghana and their findings suggested that 'gold recovery activities contributed immensely to the level of mercury in these water bodies, resulting in increased mercury concentrations downstream of each of the rivers/streams'. Akabzaa and Yidana, (2011) study assessed the spatial distribution and sources of mercury contamination in the Ankobra River Basin in southwestern Ghana. They determined that high Hg concentrations were from historic mine tailings and areas worked by artisanal and small-scale gold miners at Bondaye and Prestea recorded the highest mercury values. Donkow *et al.*, (2006) examined the mercury contamination in the different environmental compartments in the watershed of the Pra River Basin. Adimado & Baah (2002) studied Hg concentrations in human blood, urine, hair, nail and fish from Ankobra and Tano river basins in southwestern Ghana. Bannerman *et al.* (2003) reported that there was Hg and arsenic (As) contamination in sediment and water in the gold mining regions of the Ankobra river basin. Bonzongo *et al.*, (2003) also examined the extent of mercury contamination in water, sediment and soil from artisanal gold mining-impacted Ghanaian watersheds.
8. In Ghana, as mandated by the 1989 Mercury Law, mercury is officially sold through registered ASGM operators and licensed traders who are allowed to purchase the mercury to process or refine gold from the PMMC. The Mercury Law provides for the possession, or importation of mercury and related matters. Locally known as 'poho', one poho contains approximately 52.2 grams of mercury. The Mercury Law directly stipulates good mining practices in the use of mercury; however, it does not include any specific guidelines in terms of handling and disposing of mercury (Amegbey and Eshun, 2003). The law allows for the use of mercury by ASGM but it lacks any clear oversight responsibility to ensure compliance, for purchase or ultimate use and disposal and is obscure. This makes compliance and monitoring very difficult. In 2013, data from the EPA indicate up to 5,000 ASGM sites, across the country, have been approved by the agency. But there is a lack of institutional technical capacity to provide adequate assistance to assess impacts or enforce compliance, especially at the local and regional levels due to sheer numbers of ASGM miners and locations.

9. The Bank commissioned a study to identify the possible hotspots for mercury contamination in Ghana. **The study found the following areas of hotspots:** Kyebi (kibi) and its environs; Obuasi and its environs; Dunkwa Ayenfuri and Wassa Akropong and their environs; Prestia-Boadua-Asankaragwa and their environs; Banda Kwanta and its environs; Bolgatanga and its environs. These sites were prioritized by applying a risk model. The risk model involved assigning weighting factors to observed hazards according to the risks associated with status and/or activities within the town (hazard score). A susceptibility rating was assigned to the various receptors (receptor susceptibility score) that could be impacted by the identified hazards. The hazards included in the study were mercury, cyanide and dust. The hazard mapping also included Open pits 1) Open pits for the purpose of gold ore removal, and 2) leaching ponds. Pathways included water, air and land and the pathways considered in this study included: 1) direct/indirect ingestion, 2) inhalation, and 3) dermal contact. In Ghana, the main elements of marginalization that form the ASGM community is as follows:
- Large areas of land in the gold rich belts of the country have been demarcated for largescale gold mining companies. Hence, the ‘galamsey’ fight over access to productive land and resist state marginalization because of desperation to meet livelihood needs and moral injustice. Miners seeking official registration encounter serious bureaucratic and procedural hurdles. According to discussions with the ASGM community, registrations can take from 12 months up to 2 years.
 - Along with the required paperwork (maps etc.) and fees required are not something small-scale miners have readily available to them. Creating further disincentive for registration and pushing miners to operate illegally. Another reason for the illegality is the ease with which the illegal miners can sell their gold to buying agents licensed through PMMC (Hilson and Potter, 2003).
 - Institutional support to the ASGM sector comes mainly from the Minerals Commission (MC). However they are underfunded, lack the financial resources and staff to support and serve the growing ASGM sector.
 - Institutional constraints not only provide insufficient incentives for miners to register and work legally, but also preclude the large majority of them from engaging in more environmentally safe practices’.
 - In March of 2013 the government set up an Inter-Ministerial Task Force to combat illegal small-scale mining, this included the arrest and deportation of almost 4000 foreigners working directly or indirectly in ASGM which resulted in a temporary cessation of many operations around the country (Mensah, 2013). However, operations were rapidly reinstated, this time being run mostly by local citizens.
 - Failure to analyze local conditions, community dynamics and embrace miners’ concerns in the decision making process only perpetuates the mercury pollution problem within the ASGM sector.

Key Lessons derived from the sector analysis

10. **ASGM is a significant contributor to employment generation and poverty alleviation in Ghana.** It can be a traditional livelihood activity, a full-time source of employment, or a season specific part-time job and can include migrant peoples, local communities with a longstanding history of mining, and people from all walks of life. **Unplanned and unregulated ASGM has generally left a legacy of severe adverse (and irreversible) environmental, health, economic, and social impacts,** often affecting disproportionately

the poorest³⁰ and most vulnerable communities. Studies have shown that the health of the miners and other people living within the area affected by mercury contamination may be negatively affected through inhalation of mercury vapor or contaminated dusts, direct contact with mercury, through eating fish and other food, and through the ingestion of waters and soils affected by the mercury contamination.

11. This program provides the opportunity for supporting further policy enhancements in small-scale mining, while building capacity for improving monitoring and enforcement of the regulations. While there is a recognition that the use of mercury has serious environmental and health consequences, there are limited resources to demonstrate cleaner alternative technologies and also exhibit clean and feasible practices related to mine closure as mandated in the Mining policy.

Electronic waste

12. The Agbogbloshie ewaste site (15 acres) which is located on the west side of the Odaw River in the city of Accra, is the largest center for e-waste recycling and disposal in Ghana. The site is a heavily industrialized area that consists of scattered recyclers working out of small sheds and in the open. Car parts, heavy machinery, refrigerators, and other industrial and residential equipment are brought in and disassembled for economic value. Remnants of disassembled machinery litter the area and the soil is heavily stained with industrial oils. A large residential community primarily housing Agbogbloshie workers and their families consisting of small informal settlements with little electricity and running water. Work at Agbogbloshie is done on a large scale by manual disassembly of e-waste parts and by burning other items such as computer wires and refrigerator coils to recover profitable metals such as copper and aluminum that are covered with plastic encasements. Dismantling and burning are performed by young adults (estimated about 73% are aged 21 – 30 years) using handmade tools and without protection from chemicals leaving them susceptible to respiratory diseases and overexposure to chemical hazards. Potential impacts of contaminants on soil, surface and ground water indicated the following:
 - Impacts on soil could result from potential release of heavy metals such as Zn, Pb, Fe, Cu into the soil and its effect on soil organisms and nutrients;
 - Impacts on surface water resulting from run-offs from the contaminated sites into nearby Odaw Stream and the Korle Lagoon, which can impact the health organisms, including humans through the food chain; and
 - Impacts on ground water resulting from leaching of heavy metal contaminants to ground water, which can lead to severe health effects.
13. The E-Waste National Strategy Report of 2011 of Ghana identified that high level of demand has led to an influx of electronic equipment into the country, most of which are second-hand. Considerable proportions of these imports are old, near or at end-of-life which are sooner or later consigned as electronic waste. A total of about 109,648.773 tons of ewaste is estimated to have benefited recyclers.

³⁰ Most small scale miners are poor, who do not use any protective safety measures, therefore are exposed directly to contamination, such as from inhaling mercury.

IMPORT VOLUMES OF MAJOR TRACER PRODUCTS IN TONNAGE (2010 - 2014)

| ICT Equipment | | | | | |
|-----------------------------------|-------------------|------------------|------------------|---------------|-------------------|
| Imports in Tons | PC | Laptops | LCD monitors | CRT monitors | Mobile |
| Used | 5,416.25 | 28.718 | 350.23 | 14.79 | 0.39 |
| New | 61,339.935 | 1,710.12 | 350.29 | 6.40 | 700.59 |
| Total | 66,756.185 | 1,738.838 | 700.52 | 21.19 | 700.98 |
| | | | | | 69,917.713 |
| Consumer Electronics | | | | | |
| Imports in Tons | CRT TV | LCD TV | Radio | Stereo | |
| Used | 82.04 | 105.25 | 5,119.24 | 324.85 | |
| New | 142.59 | 585.35 | 267.98 | 46.19 | |
| Total | 224.63 | 690.60 | 5,387.22 | 371.04 | 6,673.49 |
| Large Household Appliances | | | | | |
| Imports in Tons | Refrigerator | | Air Conditioners | | |
| Used | 41,306.48 | | 13,196.05 | | |
| New | 24,883.53 | | 134.82 | | |
| Total | 66,190.01 | | 13,330.87 | | 79,520.88 |
| Small Household Appliances | | | | | |
| Imports in Tons | Iron | | Kettle | | |
| Used | 105.79 | | 21.11 | | |
| New | 310.25 | | 91.87 | | |
| Total | 416.04 | | 112.98 | | 529.02 |

ESTIMATED QUANTITIES OF WEEE GENERATION (TONS) (2010 - 2014)

| Total (Used/New) | ICT Equipment | Consumer Electronics | Large Household Appliances | Small Household Appliances | Total tonnage |
|-----------------------|---------------|----------------------|----------------------------|----------------------------|---------------|
| Installed electronics | 69,917.713 | 6,673.49 | 79,520.88 | 529.02 | 156,641.103 |
| Stored | 20,975.310 | 2,002.05 | 23,856.26 | 158.71 | 46,992.330 |
| WEEE to Recycling | 48,942.403 | 4,671.44 | 55,664.62 | 370.31 | 109,648.773 |

14. The refurbishing and repair sector has been found to be partially formalized, estimated to be about 20% of all refurbishing / repair businesses might be registered with the formal bodies. Collection, disassembly, material recovery and final disposal take place almost only in the informal sector. It is estimated that about 20,000 to 42,500 people are employed in the refurbishing and e-waste recycling sector in Ghana, constituting about 0.2% to 0.4% of the total labour force in Ghana (PHC, 2010). This implies that about 182,520 to 258,180 people in Ghana are partially or fully dependent on refurbishing and e-waste recycling operations, representing about 0.72% to 1.02% of the total Ghanaian population (25.37 million).

Environmental health impacts

15. Pollution resulting from discarded e-waste and its processing has been shown to have serious adverse impacts on human and environmental health as well as on air, water, biota and land. The Global Alliance on Health and Pollution currently estimates that over 3 million people are at risk of exposure to toxic chemicals through e-waste. Individuals at particular risk are the children and adults involved in the ‘recycling’ of e-waste where

exposure to lead and cadmium from cathode ray tube (CRT) processing or to dioxins and polycyclic aromatic hydrocarbons (PAHs) and other toxic chemicals from burning plastics and cables is common. Employing children in the dismantling and processing of e-waste is of particular concern. Due to their small size and stage of development, children are at higher risk from exposure to toxic chemicals than most adults. Globally humans and the environment are also at risk due to the range of toxic substances contained in e-waste that also persist in the environment and bio-accumulate, such as persistent organic pollutants (e.g., brominated flame retardants such as Polybrominated Diphenyl Ethers (PBDEs), Polychlorinated Biphenyls (PCBs), Hexabromocyclododecane (HBCD), and dioxins and furans (PCDD/Fs, PBDD/Fs) and heavy metals (e.g., lead, nickel, chromium, mercury). While these current trends tell a story of growing environmental and socio-economic risk for African countries, there is an opportunity to change some elements of the equation that would make it possible to create sustainable growth and positive local and global environmental impacts. Recycling makes business sense because end of life electrical and electronic equipment contain valuable resources and precious metals such as gold, silver, copper, steel, aluminium, and plastics. Some initiatives which have been initiated in Ghana on ewaste include:

- Pilot initiative to demonstrate environmentally sound remediation of a ewaste recycling operations within the Agbogboshie scrap yard.
- The Global E-waste Management (GEM) Network, funded by the US-EPA provides a platform for exchange of experiences among participating countries on ewaste control and management

However, there is need for taking a comprehensive approach towards integrated ewaste management, including finalization of the Draft Ewaste Rules.

Proposed alternative scenario

Under the proposed program this child project will deliver at the national level and engage at the regional level through the regional coordination child project.

Artisanal Gold Mining Sector

16. As detailed above, the unregulated and informal use of mercury in artisanal and small scale gold mining (ASGM) is creating a legacy of severe adverse (and irreversible) environmental health, economic, and social impacts. Informal, extralegal, or illegal nature of ASGM operations makes it a source of social problems, including child labor and other labor issues; land tenure issues; migration and other social instability and potential conflict. livelihood challenges and unawareness of long term impacts to health and the surrounding environment.

Component 1a: Institutional strengthening, knowledge and capacity building

17. Institutions such as the Minerals Commission (MC), the Environmental Protection Agency (EPA) and security services mandated to regulate and monitor mercury use in ASGM in accordance with the country's mining laws are either under-resourced, under-staffed or lack the capacity to enforce their mandate effectively and efficiently. The objective of this component is to strengthen the institutional systems and provide capacity building for EPA and the MC for managing the artisanal gold mining sector, including through training at the national and local levels. This component will build capacity of these institutions and support development of guidelines and monitoring systems in place for management of

mercury usage and waste in ASGM. In addition, the component will ensure both national level stakeholders coordination and participation in the regional learning and knowledge sharing activities on the harmful chemicals agenda. This will contribute to strengthening the regional partnerships and collaboration. This component will also include assistance to facilitate the formalization of the artisanal and small-scale gold mining sector; and assessment of baseline estimates of the quantities of mercury used and the practices employed in artisanal and small scale gold mining and processing within its territory. The component will assist development of strategy for promoting the reduction of emissions and releases of, and exposure to, mercury in artisanal and small-scale gold mining and processing, including mercury-free methods; Managing trade and preventing the diversion of mercury and mercury compounds from both foreign and domestic sources to use in artisanal and small scale gold mining and processing; Involving stakeholders in the implementation and continuing development of the national action plan; a public health strategy on the exposure of artisanal and small-scale gold miners and their communities to mercury. Such a strategy would include gathering of health data, training for health-care workers and awareness-raising through health facilities. Assistance would be provided to prevent the exposure of vulnerable populations, particularly children and women of child-bearing age, especially pregnant women, to mercury used in artisanal and small-scale gold mining; and dissemination of information to artisanal and small-scale gold miners and affected communities; and a schedule for the implementation of the national action plan. This component will promote transparency along the whole value chain facilitating direct access of the miners to the market in order to negotiate with the end buyer a better price for their gold in line with the global market rate, and leading to greater economic and social stability.

18. The following three lessons would be incorporated into Component 1 – (a) The policy and regulatory aspects of mining will be strengthened to include provisions for recognition of legal import of mercury. (b) A country level inventory and tracking of mercury import and use in the ASGM sector would be implemented as part of capacity building plan and (c) The artisanal miners will be trained to understand the cost-benefit analysis of producing mercury from illegal traders versus associated environmental health costs which does not get addressed due to non-transparent transactions. This supply chain of mercury and gold will include procurement of cheap and reliable source to mercury, access to credit and technical knowhow licensing, extraction and amalgamation; final gold sales and prices. Artisanal miners are expected to use these benefits to increase their organizational ability to trade responsibly, to respect and improve the lives of those who work with them, the communities in which they work and the environment.

Component 2a: Support for Policy dialogue and regulatory enhancements

19. Under the Minerals and Mining Act, 2006, Act 703, ‘every mineral in its natural state in, under or upon any land in Ghana, rivers, streams, water courses throughout the country, the exclusive economic zone and any area covered by territorial sea or continental shelf is the property of the Republic of Ghana and is vested in the President in trust for the people of Ghana’. The Act stipulates that Ghanaian as individuals or cooperatives of up to ten people, can apply for a license to mine a maximum of 10 Ha (in the case of a grant to a co-operative society of 10 or more persons and registered companies) land in areas designated for small-scale mining. However, the Mining Act is inadequate in detailing how the small-scale miners manage the environmental issues of their mining sites, including a protocol

for closure. While national laws for hazardous waste management currently exist in Ghana, including the Environmental Protection Agency Act, 1994 (Act 490) and Mercury Law, 1989 (PNDC 217), they do not address issues of legacy pollution.

20. Regulatory enhancements for Environmental and Social management will include assistance to strengthen existing legislations with respect to recycling and disposal; financing system for ewaste recycling and disposal (possibly through a prepaid fee, producer responsibility etc); use of cleaner technologies (dismantling and Recycling); and awareness raising and information dissemination.
21. The component will support the EPA in strengthening the policy requirements targeted at the ASGM sector. This will include amending the Mining Act to require small-scale miners to prepare Environment Plans which include the need for rehabilitating mines after closure and address environmental and social due diligence. Under this component, monitoring and evaluation (M&E) framework is put in place to ensure the achievement of the project outcomes in accordance with WB and GEF requirements. A project national steering committee (PNSC) will be established to coordinate and to ensure the effective implementation of different activities. The PNSC will report to the project regional steering committee on the progress of project implementation. Project Implementation Reports (PIRs) will be prepared and submitted to GEF secretariat, yearly. An independent mid-term review and terminal evaluation will be carry out as well as a terminal report. The project experiences will be disseminated to various interested stakeholders in order to increase the replication potential of the project.

Component 3a: Demonstrating application of technological tools and economic approaches

22. This component will link closely with Component 1 and will demonstrate the environmental improvement of 2-3 pilot abandoned mines, based on cost-effective and environmentally sound technologies³¹. The use of hazard-scoring and risk-ranking methodology coupled with hazard maps would provide a robust scientific basis for making the decision and prioritize actions that need to be taken to minimize or manage risks associated with various areas of amine site. Such rehabilitation will act as demonstration pilots for the small miners who will be required to rehabilitate their mines after completion of mining activities. Such demonstration projects are targeting to provide technological and financial capacity building for miners towards a more environmentally safe workplace and a formal market place, e.g. using mobile technologies for small scale miners, using micro-credits for environmentally safe technologies, etc. The Component will also enhance Government's policy towards appropriate land use for agricultural activities. The demonstrative investments will be based on assessment of economics of options for minimizing and controlling the use of hazardous chemicals, including impact on land degradation (for example use of retorts in case of mercury in ASGM) to reduce its impacts or to discourage the use of mercury and promote acceptable alternatives without impacting the livelihood and employment opportunities of ASGM. This component will also support

³¹ The project recognizes that the Minamata Convention is still to develop international guidelines related to mercury site contamination. The Bank team will maintain dialogue with the Minamata interim Secretariat, and the participating country will use the emerging guidance where relevant – as well as being able to provide relevant input to guidance development based on their experience.

the improvement of environmental and social work conditions to promote mercury abatement techniques. This will not only reduce the amount of mercury to be procured and used but also reduce the amount of mercury emissions and wastage. It will coordinate investments focusing on developing communication tools to raise awareness about the health costs and benefits of pollution, including community outreach to increase public understanding and visibility of the scale and environmental health impacts.

Ewaste

Component 1b: Institutional strengthening, knowledge and capacity building

23. This component will support capacity building activities which include (a) benchmarking of key EPA staff to acquire best practices on waste management and ensure appropriate skills transfer; (b) Awareness raising/sensitization workshops on ewaste management along with stakeholders in the value chain country-wide; (c) support to waste management unit in EPA; and (d) streamlining Customs coding with appropriate training of the Customs Officers and borders inspectorate to curtail entry of illicit e-waste in the first place. It will support strengthening of eWaste Management Regulations and Guidelines and development of systems for monitoring and enforcement, relevant to waste management with a focus on e-waste. The component will also review existing documentation and undertake a country-wise situation analysis on waste, including inventory of major toxic pollutants emanating from the sector; assessment of environmental health implications of harmful chemicals and waste and options for risk management; and economic analysis. The component will ensure both national level stakeholders coordination and participation in the regional learning and knowledge sharing activities on the harmful chemicals agenda. This will contribute to strengthening the regional partnerships and collaboration.

Component 2b: Support for policy dialogue and regulatory enhancements

24. This component will support Government's efforts in strengthening the current environmental policies and regulations and capacity to monitor; screen and evaluate health and environmental risks associated with e-waste. The component will assist development of strategy for promoting the reduction of emissions and releases of, and exposure to, harmful chemicals and hazardous waste. Such a strategy would include gathering of health data, training for health-care workers and awareness-raising through health facilities. Particular attention will be taken to prevent the exposure of vulnerable populations, particularly children and women of child-bearing age, especially pregnant women, to harmful chemicals and dissemination of information to different actors and affected communities.

Component 3b: Demonstrating application of technological tools and economic approaches for reduced risks

25. This component will support the initiation of a pilot project in Agbobloshie on implementation of integrated environmentally sound management approach to improve collection, transportation, and safe disposal/recycling of e-waste, following Article 6 of the Stockholm Convention on wastes, and relevant guidance. This will include investment in infrastructure and technologies by looking at the entire e-waste management cycle from

collection, transportation, setting up of collection centers or transfer stations and sorting stations and treatment (recycling) facility. It includes formalizing the systems, providing protective equipment for the collectors and recyclers, training and capacity building and developing protocols and methodologies for assessment of environmental health risks associated with e-waste. The Bank is envisioning to engage stakeholders already working in the field of e-waste management to leverage and eventually mainstream the existing good practices.

Incremental/additional cost reasoning and co-financing

Artisanal Gold Mining Sector

26. Under the Extractive Industries Transparency Initiative (EITI), Ghana is revising its Exploration and Production Bill to strengthen regulation of its extractive sector, inspection requirements and management of the social and environmental impact of the extractive industries. The EITI is supported by a coalition of governments, companies and civil society working together much of which is leveraged by the World Bank/MDTF technical assistance and financing support. The World Bank is also supporting Ghana with US\$5 million grant to help strengthen institutional capacity of the key ministries and agencies in the natural resources and environmental sectors. The Natural Resources and Environmental Governance (NREG) has supported the passage of six regulations to give effect to the Minerals and Mining Act of 2006, as well as the establishment of a multi-agency revenue task force. It also supports the Ghana EITI in revenue reporting and has strengthened the institutional platform for sector dialogue and the conduct of Strategic Environmental Assessment (SEA) by the Environmental Protection Agency (EPA). The NREG was among the core activities of the World Bank's Ghana Country Partnership Strategy, 2013-2016, which formed the pillar of improving economic institutions.

Ewaste

27. The World Bank has a number of ongoing set of urban sector investments which are dedicated to infrastructure investments and improved service delivery. The Local Government Capacity Support Project supports urban local governments and urban assemblies to improve their management capabilities through targeted capacity building programs. The provision of hands-on technical assistance and incentives is designed to improve service delivery and transparency. The development objectives of the Urban Water Project is to significantly increase access to the piped water system in Ghana's urban centers, with an emphasis on improving access, affordability and service reliability to the urban poor.

Global environmental benefits

Artisanal Gold Mining Sector

28. Artisanal gold mining is actually the leading cause of global mercury pollution, and it has been documented that for every gram of gold produced, artisanal gold miners release about two grams of mercury into the environment. Together, the world's 10 to 15 million artisanal gold miners release about 1000 tons of mercury into the environment each year. Demonstrating cleaner technologies and providing miners with safe alternatives will have a direct benefit of not only reducing mercury emissions but the reduction in toxic fumes

will have beneficial impacts on the health of the miners. Financial benefits also arise from better management of input, including mercury recycling. The savings in mercury point to the huge benefits that could be achieved by making such technologies an integral part of the small-scale mining process and also helping Ghana to meet its obligations under the Minamata Convention. Training on safer alternative processing methods put the emphasis on health and economic benefits, which can be obtained by using cleaner technologies. This aspect becomes especially important in the absence of alternative livelihoods. Mandating and supporting ASG miners to rehabilitate closed mines will allow revegetation of large tracts of land, support the Government of Ghana with reforestation and in some cases allow land to be returned for productive agricultural or pastoral usage.

Ewaste

- 29.** The overall socioeconomic benefit of the project is derived from the elimination of POPs releases that have significant negative impacts on environment and human health. The associated risk reduction at both a local and national level will positively impact the productivity of populations and reduce the financial burden imposed by potentially degraded public health, as well as contributing to general wellness, economic development and quality of life. This is particularly true for vulnerable parts of the population and for maternal health that would be improved by reduced POPs and PTS exposure. More specific socioeconomic benefits from the project are associated with its proactive approach to integrating the informal sector into a properly managed and funded management system.

A.2. Stakeholders. Will project design include the participation of relevant stakeholders from civil society and indigenous people? (yes /no) If yes, identify key stakeholders and briefly describe how they will be engaged in project design/preparation:

Artisanal Gold Mining Sector

Informal and formal local organizations of artisanal and small-scale miners historically have played a crucial role in Ghana. Diverse informal organizations exist among groups of pit holders, diggers, gold processors, and others and their capacity to work together to address environmental health, safety, and wellbeing is vital for the success of the community. Knowledge exchange between different groups of miners' organizations will be an important strategy in generating lessons and sharing insights about organizational development, technologies, business practices, and livelihood challenges and solutions. The key stakeholders include the Ghanaian National Association of Small Scale Mines (GNASSM), which is the oldest and most recognized body representing artisanal miners in Ghana; and the more recently formed Artisanal Mining Africa Network (AMAN). Special attention will be given to ensure the participation of indigenous people and local communities at the site level.

Ewaste

- 30.** The key stakeholders in the project are Accra Metropolitan Assembly which is responsible for enforcing regulations on informal collection: Providing a safe and secured environment for site clean-up works; and facilitating the orderly temporary settlement of recyclers to allow for clean-up and reclamation works. The National Youth Authority which will be responsible for monitoring progress of the formalization of recycling activities in

Agbobloshie. The Environmental Protection Agency, which will conduct compliance monitoring at e-waste recycling site; and lead the awareness on environmental and safety best practices regarding recycling operations. Other stakeholders include the importers and distributors of electronics and ewaste, the Customs department, informal recyclers, youth and the general community.

A.3 Risk. Indicate risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the project design (table format acceptable):

Artisanal Gold Mining Sector

| Risk Category | <i>Rating and Risk Management</i> |
|--|-----------------------------------|
| Sector Strategies and Policies | Moderate |
| Technical Design of Project or Program | Substantial |
| Institutional Capacity for Implementation and Sustainability | Moderate |
| Fiduciary | Substantial |
| Environmental and Social | Substantial |
| Stakeholders | Moderate |
| Overall | Substantial |

Ewaste

| Risk Category | <i>Rating and Risk Management</i> |
|--|-----------------------------------|
| Sector Strategies and Policies | Low |
| Technical Design of Project or Program | Moderate |
| Institutional Capacity for Implementation and Sustainability | Moderate |
| Fiduciary | Substantial |
| Environmental and Social | Substantial |
| Stakeholders | Substantial |

| Risk Category | Rating and Risk Management |
|---------------|----------------------------|
| Overall | Substantial |

A.4. Coordination. Outline the coordination with other relevant GEF-financed and other initiatives:

Artisanal Gold Mining Sector

31. The project will utilize and strengthen existing structures for national coordination to avoid duplication and to ensure coordination between the countries. Therefore, this program will build on, and complement the ongoing MIA, NAP and NIP activities in participating countries in partnership with other GEF Implementing Agencies, including UNIDO, UNDP and UNEP, which are implementing GEF projects on chemicals and waste and POPs.

- Integrated Health and Environment Observatories and legal and institutional strengthening for the Sound Management of chemicals in Africa (African ChemObs)
- Continuing Regional Support for the POPs Global Monitoring Plan under the Stockholm Convention in the Africa Region
- Enabling Activities to Review and Update the National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants
- Development of Minamata Convention on Mercury Initial Assessment in Africa
- Environmentally Sound Management of Municipal and Hazardous Solid Waste to Reduce Emission of Unintentional POPs
- Promotion of BAT and BEP to Reduce uPOPs Releases from Waste Open Burning in the Participating African Countries of COMESA-SADC Subregions
- Minamata Convention Initial Assessment in Francophone Africa I
- Sound Chemicals Management Mainstreaming and UPOPs Reduction (Kenya)
- Improve the Health and Environment of Artisanal and Small Scale Gold Mining (ASGM) Communities by Reducing Mercury Emissions and Promoting Sound Chemical Management (Senegal)

32. The project will coordinate and maintain extensive and continued stakeholder consultations at the national and regional level to support all components of the project.

Ewaste

33. The project will utilize and strengthen existing structures for national coordination to avoid duplication and to ensure coordination between the countries. The project will build on, and complement the ongoing NIP development process and will partner with the other agencies, including UNIDO, UNDP and UNEP, which are implementing GEF projects on chemicals and waste and POPs.

- Integrated Health and Environment Observatories and legal and institutional strengthening for the Sound Management of chemicals in Africa (African ChemObs)

- Continuing Regional Support for the POPs Global Monitoring Plan under the Stockholm Convention in the Africa Region
- Enabling Activities to Review and Update the National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants
- Development of Minamata Convention on Mercury Initial Assessment in Africa
- Environmentally Sound Management of Municipal and Hazardous Solid Waste to Reduce Emission of Unintentional POPs
- Promotion of BAT and BEP to Reduce uPOPs Releases from Waste Open Burning in the Participating African Countries of COMESA-SADC Subregions
- Minamata Convention Initial Assessment in Francophone Africa I
- Sound Chemicals Management Mainstreaming and UPOPs Reduction (Kenya)
- Improve the Health and Environment of Artisanal and Small Scale Gold Mining (ASGM) Communities by Reducing Mercury Emissions and Promoting Sound Chemical Management (Senegal)

B.1 Is the project consistent with the National strategies and plans or reports and assessments under relevant conventions? For biodiversity related projects, please reference the Aichi Targets that the project will contribute to achieving. (yes /no). If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, etc.:

Artisanal Gold Mining Sector

- 34.** As the 10th largest gold producer, Ghana has been actively involved in the development of the Minamata Convention, and is an early signatory. Ghana is engaged in the development of its MIA and NAP and both will be mutually supportive of this project.

Ewaste

- 35.** The project is fully responsive to Ghana's stated priority in its original NIP of 2007 to reduce releases of UPOPs from open-burning. The project is also well aligned with the Government of Ghana's emerging drive to improve waste management in the country particularly, e-waste management strategies and plans.

ANNEX A: **3. Zambia**

PART I: PROJECT INFORMATION³²

| | |
|-----------------------------|--|
| Project Title: | Reducing Environmental Health Risks resulting from POPs releases in Solid Waste dumpsites in Kabwe, Zambia |
| Country(ies): | Zambia |
| GEF Agency(ies): | WB |
| Other Executing Partner(s): | Ministry of Mines, Energy and Water Development |
| GEF Focal Area(s): | Chemicals and Wastes |

A. FOCAL AREA STRATEGY FRAMEWORK AND OTHER PROGRAM STRATEGIES³³:

| Objectives/Programs (Focal Areas, Integrated Approach Pilot, Corporate Programs) | Trust Fund | (in \$) | |
|--|------------|-----------------------|--------------|
| | | GEF Project Financing | Co-financing |
| CHEM-2 Program 3 | GEFTF | 8,256,881 | 60,300,000 |
| Total Project Cost | | 8,256,881 | 60,300,000 |

B. CHILD PROJECT DESCRIPTION SUMMARY

| Project Objective: Reduce Environmental health risks related to POPs in waste in the Zambia through strengthened institutional partnership and capacity | | | | |
|--|------------------------------|--|-----------------------|--------------|
| Project Components | Financing Type ³⁴ | Project Outcomes | (in \$) | |
| | | | GEF Project Financing | Co-financing |
| Institutional strengthening, knowledge and capacity building | TA | <i>Outcome:</i> +Improved and regular environmental monitoring of POPs and inspections <i>Indicative targets:</i> + Trained inspection officers | 1,800,000 | 15,964,686 |
| Support for policy dialogue and regulatory enhancements | TA | <i>Outcome:</i> *Policy framework for management of harmful chemicals related to POPs <i>Indicative targets:</i> +Guidelines and checklists in place which are easily | 1,800,000 | 12,500,450 |

³² This Concept Note is intended to convey whatever preliminary information exists at this stage on a child project and that is indicative of how it will contribute to the overall Program.

³³ When completing Table A, refer to the Program Results Framework, which is already mapped to the relevant [Focal Area Results Framework](#) in the [GEF-6 Programming Directions](#).

³⁴ Financing type can be either investment or technical assistance.

| | | | | |
|--|-----|--|------------------|-------------------|
| | | accessible and understood by different actors +Effective and wide-spread communication of the revised policy +Successful implementation of the project and lessons learned disseminated +Project intervention monitored and reported +Project progress evaluated | | |
| Demonstrating application of technological tools and economic approaches | INV | <i>Outcome:</i> +Reduced environmental health risks from POPs releases in urban waste in Kabwe municipality <i>Indicative targets:</i> +Reduced open dumping and burning of waste +Reduction of releases of UPOPs | 4,244,037 | 30,000,000 |
| Subtotal | | | 7,844,037 | 58,465,136 |
| Project Management Cost (PMC) ³⁵ GEFTF | | | 412,844 | 1,834,864 |
| Total Project Cost | | | 8,256,881 | 60,300,000 |

For multi-trust fund projects, provide the total amount of PMC in Table B, and indicate the split of PMC among the different trust

C. CO-FINANCING FOR THE PROJECT BY SOURCE, BY TYPE AND BY NAME

| Sources of Co-financing | Name of Co-financier | Type of Co-financing | Amount (\$) |
|---------------------------|----------------------|----------------------|-------------------|
| GEF Agency | IDA | Loan | 60,000,000 |
| Recipient Government | Government of Zambia | In-Kind | 300,000 |
| Total Co-financing | | | 60,300,000 |

D. TRUST FUND RESOURCES REQUESTED BY AGENCY(IES), COUNTRY(IES) AND THE PROGRAMMING OF FUNDS ^{a)}

| GEF Agency | Trust Fund | Country/Regional / Global | Focal Area | Programming of Funds | (in \$) | | |
|------------|------------|---------------------------|------------|----------------------|---------------------------|------------------------------|---------------|
| | | | | | GEF Project Financing (a) | Agency Fee (b) ^{b)} | Total (c)=a+b |

| | | | | | | | |
|----------------------------|--------|--------|-----------|------|-----------|---------|-----------|
| WBG | GEF TF | Zambia | Chemicals | POPS | 8,256,881 | 743,119 | 9,000,000 |
| Total GEF Resources | | | | | 8,256,881 | 743,119 | 9,000,000 |

- a) No need to fill this table if it is a single Agency, single Trust Fund, single focal area and single country project.
- b) Refer to the [Fee Policy for GEF Partner Agencies](#).
- c) If Multi-Trust Fund project :PMC in this table should be the total amount; enter trust fund PMC breakdown here ()

PART II: PROJECT JUSTIFICATION

PROJECT OVERVIEW

A.1. Project Description. Briefly describe: 1) the global environmental and/or adaptation problems, root causes and barriers that need to be addressed; 2) the baseline scenario or any associated baseline projects, 3) the proposed alternative scenario, with a brief description of expected outcomes and components of the project, 4) incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing; 5) global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF); and 6) innovation, sustainability and potential for scaling up.

Background

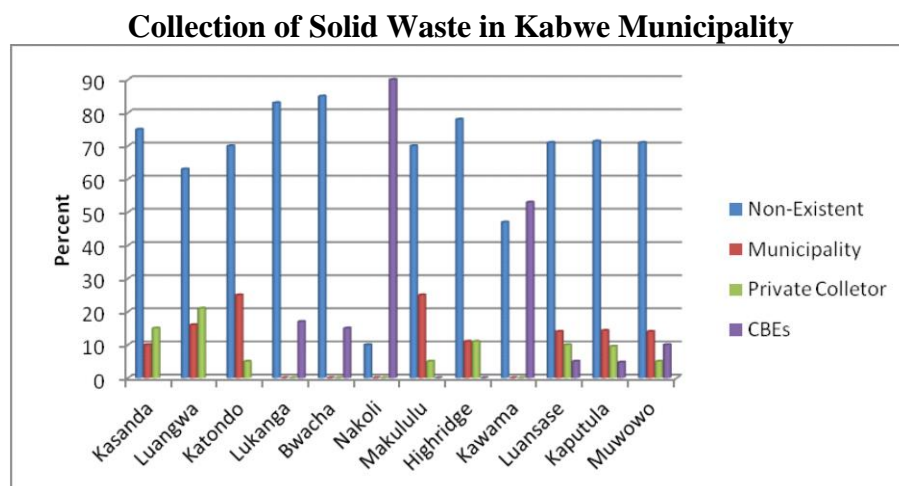
36. Zambia has signed the Stockholm Convention (SC) on Persistent Organic Pollutants (POPS) on May 23, 2001 and ratified it on July 7, 2006. UNIDO, as GEF implementing agency assisted Zambia to develop its NIP which it submitted on November 5, 2009 and to further update it as part of its commitment under the SC. POPs are a group of chemical substances that persist in the environment, can be transported far from their sources and bioaccumulated through the food web, and can “lead to serious health effects including certain cancers, birth defects, dysfunctional immune and reproductive systems, greater susceptibility to disease and even diminished intelligence.” Under the Stockholm Convention, a total of 26 chemical substances are listed as POPs, including pesticides (such as DDT), industrial chemicals (such as polychlorinated biphenyls, PCBs) and unintentional by-products of industrial and combustion processes (such as dioxins and furans). The last group of chemicals is often called unintentionally produced POPs (UPOPs).

37. Kabwe is considered as Africa's most polluted city and has the dubious distinction of being ranked as the world's fourth most polluted site. The area is a significantly large source of dioxins and furans emissions in Zambia through uncontrolled combustion from urban waste dumps. Many years of unregulated lead mining and indiscriminate disposal has resulted also in release of heavy metals in dust particles, which settled on the ground in the surrounding areas of the mines. There are a large number of informal settlements given the low supply of formal low cost housing as well as serviced land. Unemployment rates are steadily climbing due to the closure of the lead mines and little opportunities for alternative livelihoods.

Baseline scenario

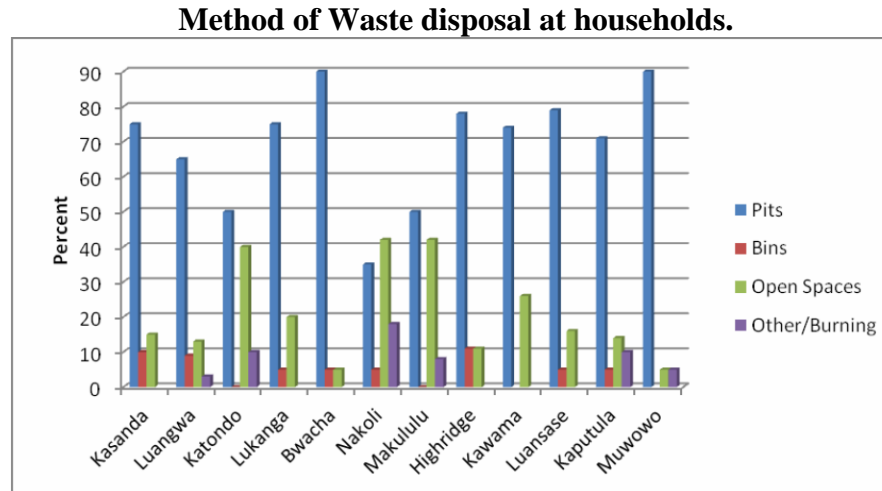
POPs releases from Solid Waste in Kabwe

38. The widespread and unsound disposal of chemically contaminated waste is a serious challenge in Kabwe. As a growing transit city between Lusaka and the mining belt, it is getting rapidly urbanized, resulting in generation of huge quantities of municipal, medical and industrial waste. Much of this waste is dumped in haphazardly and contains a potentially toxic mix of industrial, hospital, mining waste (including mercury) and hazardous household waste, such as plastic, batteries, and mercury containing waste. Indiscriminate burning results in dioxins and furans releases and are a further source of toxic pollution to land and surrounding environment, and health risks to poor communities and workers who are exposed. Lack of knowledge, public pressure and scientifically verifiable evidence about the environment health risks from such hazardous waste and activities often restrains governments from developing appropriate regulatory frameworks and implementation approaches. The unregulated open burning of mixed waste and the presence of chlorinated precursors and catalytic metals (copper iron) from electrical and electronic devices and from medical devices are the main factors for the formation and releases of UPOPs in open burning processes as well as other environmental pollutant releases. The Zambia National Implementation Plan (NIP) for POPs indicates Kabwe as a hotspot for POPs. A survey was undertaken which showed that waste collection service is non-existent and potentially hazardous waste remains in the direct living environment, as shown in the figure below.



39. Over 70% of all households in all the zones dispose of their waste in pits dug in their backyard. The rest use open public spaces, bins or burned their waste (and create again contaminated airborne particles). There is no special facility for hazardous waste – all the contaminated waste of Kabwe end up in the solid waste dumpsite. There is a presence of waste pickers or scavengers on solid waste sites, with open burning also practiced and there is no awareness of hazardous waste handling. This results in public health risks associated with such as plagues of flies, and mosquitoes and the spread of infectious diseases. Open burning of non-segregated urban wastes and other toxic wastes (including e-waste, plastics containers, tires, heavy metal such as lead and mercury), constitutes an undesirable option

for waste management results in incomplete combustion and release of unintentionally produced POPs.



40. Contaminated soils, dust and plant residues end up in the solid waste system as wastes. Contaminated dust and soils are collected from the streets by sweepers and without any protection transported to local dumping sites in neighborhoods or to the official landfill. Unemployed women and youth scavenge in these contaminated dumpsites for livelihood purpose, including stone-breaking, sorting plastics and other recyclables. Due to the contaminated nature of the waste in these dumpsites, which is a toxic mix of municipal solid waste and hazardous waste this scenario entails huge environmental health risks for the poor and vulnerable people of Kabwe.

Policy Framework

41. The Government’s National Solid Waste Management Strategy (NSWMS) proposes integrated approaches to addressing the problem of poor solid waste management. It focuses on promotion of sustainable waste management practices and rational utilization of natural resources for reduced environmental health risks. Employing a multi-sectoral integrated and holistic approach involving all the key stakeholders, which focuses on maximizing the economic value of waste and adopting environmentally sound treatment and disposal facilities/practices.

Social Issues

42. In Kabwe, waste handling disproportionately touches the lives of the most vulnerable people, i.e. the poor and unemployed and women.

Key Lessons derived from the analysis detailed above:

43. In Kabwe hazardous waste streams are mixed with municipal solid wastes and then either dumped or burned in the open air. This raises issues of environmental and social justice, as the people most affected by such precarious practices are usually the poor who live and work adjacent to dump sites. The unsound management of waste can lead to mutually reinforcing undesirable effects. It can pollute and contaminate the environment,

pose a threat to human health and represent a loss of resources in the form of both materials and energy. The management of waste in Kabwe is further complicated by the range and diversity of waste generators, from mining and a wide variety of manufacturers through agricultural and medical waste to household rubbish. In addition, the sound management of municipal waste constitutes a sizable and continuous part of a municipality's budget. The poor of Kabwe face increased risks of exposure to toxic and hazardous chemicals and wastes, who routinely face such risks because of their occupation, poor living standards and lack of knowledge about the detrimental impacts of exposure to these chemicals and wastes. It has been documented that high capital investment in the solid waste management sector does not necessarily lead to improvements in the quality of service. On the other hand, substantial improvements can be achieved in many cases by making low-cost modifications in the existing system, with the focus being on increasing system efficiencies. Examples of such improvements are the efficient design of collection routes, modifications in the collection vehicles, reductions in equipment downtime, and public education, (e.g., education and communication leading to the production of less waste and the reduction of litter).

44. Kabwe does not have the infrastructure to deal with ever increasing complex waste streams and nor does it have the regulatory and physical infrastructure to derive some rebate from the recyclable materials that are inevitably part of municipal waste. The municipality has insufficient capacity for the recovery and recycling of various types of waste streams such as plastics and lack of equipment to deal with the collection, transportation and disposal of waste. Awareness of the impact of hazardous waste on human health and the environment is also very poor.

Proposed alternative scenario

Under the proposed program this child project will deliver at the national level and engage at the regional level through the regional coordination child project

Component 1: Institutional strengthening, knowledge and capacity building

45. The objective of this component is to strengthen the institutional and legislative framework for managing risks due to POPs releases and promoting an area based approach for sustainable waste management practices in line with Government's National Solid Waste Management Strategy (NSWMS). It will strengthen the capacity for municipalities to manage the collection, transportation and disposal waste and build partnerships with private sector for improved recovery and recycling, leading to reduced UPOPs releases, as well as ensuring that POPs containing mining waste, e.g. PCBs, is treated separately. Additionally, the municipality will establish linkages for improved livelihoods opportunities in collaboration with the private sector. This component will build capacity of these institutions and support development of guidelines and monitoring systems in place and building awareness on sound management of waste and its impact on human health and the environment. In addition, the component will ensure both national level stakeholders coordination and participation in the regional learning and knowledge sharing activities on the harmful chemicals agenda. This will contribute to strengthening the regional partnerships and collaboration. This component will support initiatives taken by Government of Zambia to formalize the waste sector, specifically to manage environmental health implications of poor management of waste and emissions of POPs associated with the solid waste management. This will include actions such as providing recommendations

for improving collection and recycling systems and training recyclers and rag pickers on occupational health and safer practices.

Component 2: Support for policy dialogue and regulatory enhancements

46. This component will support Government's efforts in strengthening the current environmental policies and regulations and capacity to monitor; screen and evaluate health and environmental risks associated with POPs and hazardous chemicals. The component will assist development of strategy for promoting the reduction of emissions and releases of, and exposure to, POPs and priority chemicals. Such a strategy would include gathering of health data, training for health-care workers and awareness-raising through health facilities. Particular attention will be taken to prevent the exposure of vulnerable populations, particularly children and women of child-bearing age, especially pregnant women, to POPs and hazardous chemicals; and dissemination of information to different actors and affected communities.

Component 3: Demonstrating application of technological tools and economic approaches

47. The project will focus on improving the waste value chain and in a number of measures that will reduce UPOPs releases from solid waste by strongly limiting the quantities of waste subject to uncontrolled burning: invest into improving the management of waste collection; transportation; treatment and disposal and improved recycling of waste. The current dumpsite will be upgraded into a sanitary landfill (through IDA financing), and feasibility study of short- and long-term BAT/BEP actions will be supported to determine the volumes and types of waste and the economic viability for private sector collaboration. The component will ensure the segregation between hazardous contaminated wastes from the other non-hazardous waste streams. The component focus on training the existing rag-pickers and providing them with occupational health and safety training and equipment. This component will also look into the ways to reduce the impact of chemical pollution emanating from unregulated landfills in economic and socially acceptable manner and support the development of communication tools to raise awareness about the health costs and benefits of pollution management, including community outreach to increase public understanding and visibility of the scale and environmental health impacts.

Incremental/additional cost reasoning and co-financing

48. The World Bank is supporting the Government of Zambia on a Mining and Environment Remediation and Improvement Project. Its objective is to reduce environmental health risks and lead exposure to the local population associated with the mining sector in critically polluted areas in Kabwe and Copperbelt provinces through improved capacity of the key institutions at the national, subnational and local levels. Its main objectives include strengthening environmental management, improving job opportunities for affected people and optimizing existing financial mechanisms to identify, finance, implement and monitor feasible environmental and social measures for prioritized contaminated areas. Kabwe is one of the primary focus areas of the project, and investments will include remediation and rehabilitation of old mining tailing dumps and indiscriminate contaminated sites; strengthening of capacity of the Kabwe Municipal council for improved environmental monitoring of different categories of waste and health interventions. The activities under

the proposed GEF project have been designed to be complementary to the Bank supported MERIP project

Global environmental benefits

49. Improved management and reduced open and uncontrolled burning of solid waste has a number of global benefits through reduction of UPOPs releases (and potentially other POPs present in the waste including PCBs and PBDEs), and at the local level whereby communities live in cleaner and healthier neighborhoods with reduced risk of public health diseases. Improved recycling systems provides better business opportunities and economic growth along with enhanced local ownership, responsibilities and participation. Sound waste treatment and disposal results in reduced toxic emissions to air, water and land from POPs which has not only local benefits of reduced pollution but also transboundary and regional benefits. Reduced burning of mixed solid waste will reduce the atmospheric deposition of POPs such as dioxins and furans. Alternative treatment technologies for solid waste management can not only eliminate pathogenic agents or failure to immobilize heavy metals, but also benefit the public health and environmental safety, including reduction of greenhouse gas emissions such as carbon dioxide and methane. The project will promote the replication of alternative processes and techniques to prevent POPs formation due to open burning of different categories of wastes, including municipal, hazardous and medical wastes, following Stockholm Convention Article 5 and related BAT/BEP guidance. In line with the implementation of the GEF focal area strategy, the project, based on the lessons learnt from demonstration activities, will strengthen regulatory measures, institutional capacities and technical capabilities in addressing environmentally sound waste management.

A.2. Stakeholders. Will project design include the participation of relevant stakeholders from civil society and indigenous people? (yes /no) If yes, identify key stakeholders and briefly describe how they will be engaged in project design/preparation:

50. Informal and formal local organizations will play a crucial role in awareness building and management of waste in Kabwe. The key stakeholders include the Kabwe Environmental and Rehabilitation Foundation (KERF), whose role is to bring educational and healthcare services into each community and Pact Zambia is aimed at strengthening the organizational and managerial capacity of selected Zambian NGOs working in the areas of health, democracy and good governance. The project will reach out to Women for Change (WFC) which is a Zambian gender focused NGO working with communities, especially women and children, in rural areas to contribute towards sustainable human development using popular education methodologies. The project will focus on training of workers as well as vulnerable social groups, scavengers and unemployed youth and will enhance job opportunities while reducing/eliminating the exposure to uPOPs and other harmful contaminants. The interventions of the project will alleviate social and economic degradation both for men and women in the waste management sector. The project will seek the partnership of the private sector involved in transportation/collection/recycling and disposal of wastes to invest in BAT/BEP and sound waste and residue management plans. Special attention will be given to ensure the participation of indigenous people and local communities at the site level.

A.3 Risk. Indicate risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the project design:

| Risk Category | Rating and Risk Management |
|--|----------------------------|
| Sector Strategies and Policies | Moderate |
| | |
| Technical Design of Project or Program | Moderate |
| | |
| Institutional Capacity for Implementation and Sustainability | Substantial |
| | |
| Fiduciary | Substantial |
| | |
| Environmental and Social | Substantial |
| | |
| Stakeholders | Substantial |
| | |
| Overall | Substantial |

A.4. Coordination. Outline the coordination with other relevant GEF-financed and other initiatives:

- 51.** The project will utilize and strengthen existing structures for national coordination to avoid duplication and to ensure coordination between the countries. The project will partner with the other agencies, including UNIDO, UNDP and UNEP, which are implementing GEF projects on chemicals and waste and POPs.
- Integrated Health and Environment Observatories and legal and institutional strengthening for the Sound Management of chemicals in Africa (African ChemObs)
 - Continuing Regional Support for the POPs Global Monitoring Plan under the Stockholm Convention in the Africa Region
 - Enabling Activities to Review and Update the National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants
 - Development of Minamata Convention on Mercury Initial Assessment in Africa
 - Environmentally Sound Management of Municipal and Hazardous Solid Waste to Reduce Emission of Unintentional POPs
 - Promotion of BAT and BEP to Reduce uPOPs Releases from Waste Open Burning in the Participating African Countries of COMESA-SADC Subregions
 - Minamata Convention Initial Assessment in Francophone Africa I
 - Sound Chemicals Management Mainstreaming and UPOPs Reduction (Kenya)
 - Improve the Health and Environment of Artisanal and Small Scale Gold Mining (ASGM) Communities by Reducing Mercury Emissions and Promoting Sound Chemical Management (Senegal)

B.1 Is the project consistent with the National strategies and plans or reports and assessments under relevant conventions? For biodiversity related projects, please reference the Aichi Targets that the project will contribute to achieving. (yes /no). If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, etc.:

52. The project is fully responsive to Zambia’s stated priority in its original NIP of 2007 to “minimize PCDD/F emissions from uncontrolled domestic waste burning” – by far the largest estimated source of UPOPs releases in the country. The country is engaged in the review and update of its NIP – a process that will be mutually supportive with this project.

ANNEX A: **4. Kenya**

PART I: PROJECT INFORMATION³⁶

| | |
|-----------------------------|--|
| Project Title: | Reducing environmental health risks by improving management of electronic waste in Kenya |
| Country(ies): | Kenya |
| GEF Agency(ies): | WB |
| Other Executing Partner(s): | Ministry of Environment, Water and Natural Resources |
| GEF Focal Area(s): | Chemicals and Waste |

A. FOCAL AREA STRATEGY FRAMEWORK AND OTHER PROGRAM STRATEGIES³⁷:

| Objectives/Programs (Focal Areas, Integrated Approach Pilot, Corporate Programs) | Trust Fund | (in \$) | |
|--|------------|-----------------------|--------------|
| | | GEF Project Financing | Co-financing |
| CHEM-2 Program 3 | GEFTF | 8,073,395 | 40,300,000 |
| Total Project Cost | | 8,073,395 | 40,300,000 |

B. CHILD PROJECT DESCRIPTION SUMMARY

| Project Objective: Reduce emissions of uPOPS from open burning of e-waste and other wastes in the Kenya through strengthened institutional partnership and capacity. | | | | |
|--|------------------------------|---|-----------------------|--------------|
| Project Components | Financing Type ³⁸ | Project Outcomes | (in \$) | |
| | | | GEF Project Financing | Co-financing |
| Institutional strengthening, knowledge and capacity building | TA | <p><i>Outcome:</i> improved and regular environmental monitoring and inspections</p> <p><i>Indicative targets:</i> + Trained inspection officers</p> | 1,900,000 | 8,500,000 |
| Support for policy dialogue and regulatory enhancements | TA | <p><i>Outcome:</i> Policy framework for management of harmful chemicals related to e-waste</p> <p><i>Indicative targets:</i> +Guidelines and checklists in place which are easily accessible and understood by different actors</p> | 1,800,000 | 9,330,272 |

³⁶ This Concept Note is intended to convey whatever preliminary information exists at this stage on a child project and that is indicative of how it will contribute to the overall Program.

³⁷ When completing Table A, refer to the Program Results Framework, which is already mapped to the relevant [Focal Area Results Framework](#) in the [GEF-6 Programming Directions](#).

³⁸ Financing type can be either investment or technical assistance.

| | | | | |
|--|-----|---|------------------|-------------------|
| | | +Effective and wide-spread communication of the revised policy +Successful implementation of the project and lessons learned disseminated +Project intervention monitored and reported +Project progress evaluated | | |
| Demonstrating application of technological tools and economic approaches | INV | <i>Outcome:</i> Program component objectives successfully implemented <i>Indicative targets:</i> + Improved capacity of key stakeholders to ensure program sustainability + reduced UPOPs releases | 3,969,725 | 20,634,864 |
| Subtotal | | | 7,669,725 | 38,465,136 |
| Project Management Cost (PMC) ³⁹ GEFTF | | | 403,670 | 1,834,864 |
| Total Project Cost | | | 8,073,395 | 40,300,000 |

For multi-trust fund projects, provide the total amount of PMC in Table B, and indicate the split of PMC among the different trust

C. CO-FINANCING FOR THE PROJECT BY SOURCE, BY TYPE AND BY NAME

| Sources of Co-financing | Name of Co-financier | Type of Co-financing | Amount (\$) |
|---------------------------|----------------------|----------------------|-------------------|
| World Bank | NaMSIP | Loan | 30,000,000 |
| World Bank | KCP | Loan | 10,000,000 |
| Recipient Government | Government of Kenya | In-Kind | 300,000 |
| Total Co-financing | | | 40,300,000 |

D. TRUST FUND RESOURCES REQUESTED BY AGENCY(IES), COUNTRY(IES) AND THE PROGRAMMING OF FUNDS ^{a)}

| GEF Agency | Trust Fund | Country/ Regional/ Global | Focal Area | Programmin g of Funds | (in \$) | | |
|----------------------------|------------|---------------------------------|-----------------|-----------------------------|---------------------------|------------------------------|------------------|
| | | | | | GEF Project Financing (a) | Agency Fee (b) ^{b)} | Total (c)=a+b |
| WBG | GEF TF | Kenya | Chemicals and V | POPS | 8,073,395 | 726,605 | 8,800,000 |
| Total GEF Resources | | | | | 8,073,395 | 726,605 | 8,800,000 |

³⁹ For GEF Project Financing up to \$2 million, PMC could be up to 10% of the subtotal; above \$2 million, PMC could be up to 5% of the subtotal. PMC should be charged proportionately to focal areas based on focal area project financing amount in Table D below.

- a) No need to fill this table if it is a single Agency, single Trust Fund, single focal area and single country project.
- b) Refer to the Fee Policy for GEF Partner Agencies.
- c) If Multi-Trust Fund project :PMC in this table should be the total amount; enter trust fund PMC breakdown here ()

PART II: PROJECT JUSTIFICATION

PROJECT OVERVIEW

A.1. Project Description. Briefly describe: 1) the global environmental and/or adaptation problems, root causes and barriers that need to be addressed; 2) the baseline scenario or any associated baseline projects, 3) the proposed alternative scenario, with a brief description of expected outcomes and components of the project, 4) incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing; 5) global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF); and 6) innovation, sustainability and potential for scaling up.

Background

1. Electronic waste is Kenya's fastest growing waste component, with an estimated 17,000 tons of electronic waste generated in annually. (UNEP). When e-waste is burnt, toxic substances controlled under the Stockholm convention such as UPOPs are generated and POPs contained in the waste such as PBDEs are released. The high rate of e-waste accumulation in Kenya is caused by incomplete product life-cycles, the increasing affordability of electronics, and donations of used electronics from other countries. Illegal import of e-waste or used electronics from all over the world is a major source of e-waste in African countries like Nigeria, Ghana, Kenya, etc. This is driven by the demand of inexpensive e-waste and secondary materials, as well as cheap dumping prices compared to the treatment with stricter standards in the export countries. Despite several initiatives, such as Computer for Schools Kenya (CFSK) and its offshoot Waste Electrical and Electronic Equipment Centre (WEEE Centre) that operate Kenya's few e-waste recycling centers; and mobile phone collection initiatives from Nokia and HP, the recycling activities of e-waste in Kenya are usually carried out on an informal basis, often involving open burning in unmonitored dumpsites or landfills. This predominantly rudimentary recycling has caused substantial damage to the health of scavengers and local environment. In fact, the management of hazardous waste and toxic pollutants from the informal waste recycling sector is an emerging challenge for Kenya, and is resulting in serious environmental and public health hazard in rural and urban areas that needs to be addressed in a collaborative manner.
2. **Kenya is a party to the Stockholm Convention on Persistent Organic Pollutants (POPs)** which was ratified on September 24, 2004, and developed its National Implementation Plan (NIP) in June 2007 with the assistance of UNEP as GEF Agency. Kenya has already completed the process of updating its NIP as part of its commitment under the SC. Under the Stockholm Convention, a total of 26 chemical substances are listed as POPs. Furthermore, by decision SC-4/19, the COP decided to undertake a work programme to provide guidance to Parties on how best to restrict and eliminate these newly listed POPs and invited Parties to support work on the evaluation of alternatives and other work related to the restriction and elimination of these new POPs. Polybromodiphenyl ether congeners including tetraBDE, pentaBDE, hexaBDE, and heptaBDE inhibit or

suppress combustion in organic materials and therefore are used as additive flame retardants, which are listed under Annex A of the Stockholm Convention with a specific exemption for use as articles containing these chemicals for recycling in accordance with the provision in Part IV of Annex A of the Stockholm Convention.

Barriers to sound e-waste management in Kenya

If barriers to e-waste management in Kenya are not identified and eliminated, Kenya will continue encountering the problem of increased e-waste and associated environmental and health impacts as a result of poor disposal. The World Bank Case Study provided this assessment:

- There is insufficient legislation dealing specifically with E-waste aggravated by lax enforcement of laws dealing with waste more generally.
- There is a lack of effective regulatory frameworks and infrastructure for sound hazardous waste management, including safe disposal and recycling is a critical barrier to E-waste recycling in Kenya.
- The existing system for managing E-waste in Kenya is generally not sustainable because mechanisms for collecting, sorting, reuse, refurbishing, repairing, and remanufacturing are not well developed and/or implemented.
- There is low public awareness of the hazardous nature of electronic waste is pervasive resulting, along with economic factors, in the import and use of low end or crude E-waste management techniques.
- The practices for managing E-waste are still mostly handled by the informal sector. Most of these operators have inadequate skills, are neither registered nor authorized and operate in a secretive manner. These operations are well connected to the supply chain processes of sourcing the raw material to finding markets for the recovered materials during post-recycling operations. The processes are highly toxic and impact adversely to both the environment and human health.
- Available data on E-waste arising in Kenya is poor and insufficient and estimation techniques are inadequate but required for extension of known data to national coverage and this impedes recycling efforts and abilities.
- Importation of E-waste is a big problem in Kenya just like any SSA country and compounds the problem of E-waste and ought to be stopped or selectively stopped primarily through regulations.

Source: World Bank-Kenya (2014).

3. Open waste burning is the dominant method of waste disposal in the urban and peri-urban areas in Kenya, due to lack of a functioning system of waste management and in the absence of government enforcement on the waste disposal. Such open burning for waste disposal is the significant source of Polybrominated Diphenyl Ethers (PBDEs), Polychlorinated Biphenyls (PCBs), Hexabromocyclododecane (HBCD), dioxins, furans, cadmium, beryllium, and lead release to the environment and can lead to severe human health and environmental hazards. The composition of waste in the urban areas is changing with an increased uptake of the use of ICT equipment which in time will reach the end of life and has to be disposed of in a sustainable manner. There are also rapidly increasing e-waste volumes, both domestically generated as well as through imports and there are no accurate estimates of the quantity of e-waste generated and recycled. In order to mitigate these challenges, there is a need to establish a plan for sustainable waste management.

4. Current level of institutional capacity (technical, financial and administrative) to monitor enforce good practices and manage health and environmental consequences is limited. The issue is a complex one, and appropriate policies and actions must deal with regulating the sector, instituting appropriate standards and work practice requirements, cleaning up contaminated sites, monitoring of exposure and effect, implementing cleaner technologies and capacity building and awareness raising. Nowadays, there are e-waste dump sites in a number of African countries including Kenya which is urgently trying to enact legislation to target disposal of used electronics.

Baseline scenario

Electronic Waste Management in Kenya

5. Kenyan annual e-waste generation includes 11,400 tonnes of old refrigerators, 2,800 tonnes of TVs, 2,500 tonnes of personal computers, 500 tonnes of printers and 150 of mobile phones (UNEP). Collection and recycling of e-waste a major challenge due to the fact that it contains a whole range of end-of-life products, many of which are persistent, bio-accumulative and toxic substances, such as persistent organic pollutants (e.g., brominated flame retardants -PBDEs and PCBs), and heavy metals (e.g., lead, nickel, chromium, mercury). The recycling activities of e-waste in Kenya is mostly usually carried out on an informal basis, often involving open burning in unmonitored dumpsites or landfills. This rudimentary recycling has caused substantial damage to the health of scavengers and local environment. Leaching and evaporation of these toxic substances occurs at the e-waste sites and results in the contamination of surrounding natural resources including soil, crops, drinking water, livestock and fish. Burning of e-waste, which is a common method of utilization, generates further toxic substances such as UPOPs. Kenya has low labor costs and no enforcement of health and safety regulations for workers, especially in informal sector, who are exposed to high levels of toxic substances. These workers are generally the urban poor and scavengers are unregulated. Public awareness of the hazardous nature of e-waste is low and along with economic factors, which results in the use of low end or crude waste management techniques which are highly polluting.

Collection and Recycling Pilots in Kenya

E-waste is a potential investment sector nationally and sub-regionally and Kenya is well poised to play a sub regional role as a hub for e-waste recycling due to the presence of adequate infrastructure (port and road) necessary for investing in e-waste. A number of options are piloted:

- **Producer Take Back and Storage.** In this collection mechanism, E-waste is taken back directly by producers either directly at their facilities or designing collection centers and then fed into the E-waste system. This usually applies to larger commercial equipment and operates on the principle of “new equipment replacing the old ones”. HP is involved in this pilot.
- **Private Collection Centers.** The establishment of East African Compliant Recycling (EACR) facility in 2013, which demonstrates the potential for investments in e-waste as a sector in Kenya, has established e-waste collection centers in Nairobi County (5 Collection centers so far), where consumers, organized groups (youth and women groups etc.), private and government institutions among others drop of e-wastes. EARC pays for every e-waste dropped in these centers, which it then takes to its plant for recycling. The subsequent expansion demonstrates that the proper management of e-waste in Africa is achievable. e-waste is a resource and properly managed generates local income and employment while fully addressing current health, safety and environmental impact issues.
- **Economic Benefits Related to Collection, Recycling.** E-waste collection has economic benefits in terms of creation of employment for workers at the collection centres and drivers for the trucks. Also, the process of recycling in order to obtain the highest possible result applies labor intensive methods that are used to completely disassemble and separate items into core materials and components in order to be able to sell the recycled products.

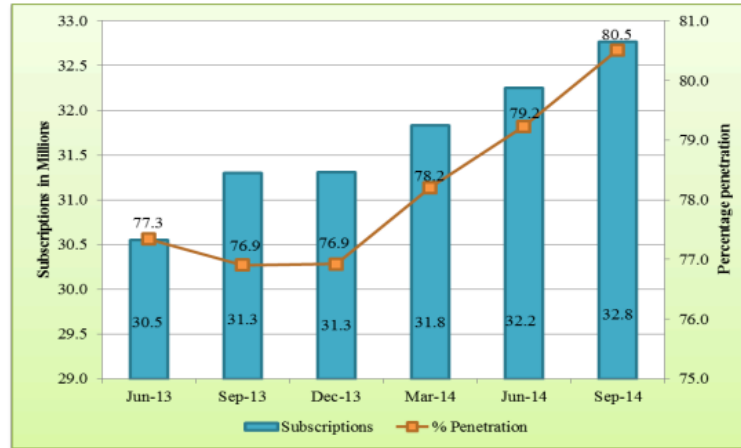
Source: World Bank-Kenya (2014).

6. Enforcement of regulations is also challenging due to the diversity and variety of e-waste streams, scattered sources, unregulated imports and the large informal workforce. Additionally, lack of reliable data (like inventory information on toxic substances like PBDEs production, importation and usage) difficulty in inventorisation) poses a challenge to design an e-waste management strategy and to an industry wishing to make rational investment decisions. Communications Authority of Kenya reported 80% of mobile phone penetration in the country, increasing by year⁴⁰. The Government estimates that in the next five years, the country will be struggling with several thousand tons of dead cells phones in addition to broken computers, printers, refrigerators, analogue television sets and useless transmitters. UNEP estimates indicate that Kenya, Tanzania and Uganda had over 10 million mobile phone subscribers in 2010, which is increasing by year. As more new ICT end-users get connected, ICT hardware consumption will increase. As the products become obsolete, e.g. the average lifespan of a laptop is around four years, the volume of e-waste will also increase. Today, Kenya generates on average 3,000 tonnes of e-waste per year from computers, monitors, printers, mobile phones, fridges and batteries amongst other devices⁴¹.

⁴⁰ Communications Authority of Kenya Report, 2014

⁴¹ E-waste Management in East African Community: Edgar Napoleon Asimwe

Figure 1: Cell Phone Penetration Rate in Kenya (2014)



Source: CA, Operators' Returns,

7. Despite the existing Waste Management Regulations (2006) and the development of the draft Electronic Waste Management Regulations (NEMA), the institutional framework for waste management in Kenya is not fully operational. In the case of e-waste management, there is a need for supporting standards or guidelines for e-waste management and their enforcement, based on the new national regulations. The lack of infrastructure, knowledge and systems in e-waste handling present a significant challenge.
8. At the consumer and producer levels in Kenya there is insufficient awareness on various aspects of waste management: on the stakeholder roles and responsibilities, the cycle of handling such waste, the opportunities that lie in safe disposal of such and the potential of using waste as a resource. The roles are spread to various key stakeholder institutions with no clear coordination, accountability and enforcement mechanisms. Stakeholder coordination is very pertinent in order to ensure that waste, including e-waste, is managed jointly with other line ministries like Ministry of Environment and Natural Resources, Ministry of Health, Ministry of Education, Ministry of Industrialization and Enterprise Development, Ministry of Information, Communication and Technology, and Ministry of Devolution and Planning, among others.

Environmental health impacts

9. Pollution resulting from discarded e-waste and its processing has been shown to have serious adverse impacts on human and environmental health as well as on air, water, biota and land. The Global Alliance on Health and Pollution currently estimates that over 3 million people are at risk of exposure to toxic chemicals through e-waste. Individuals at particular risk are the children and adults involved in the 'recycling' of e-waste where exposure to lead and cadmium from cathode ray tube (CRT) processing or to dioxins and polycyclic aromatic hydrocarbons (PAHs) and other toxic chemicals from burning plastics and cables is common. Employing children in the dismantling and processing of e-waste is of particular concern. Due to their small size and stage of development, children are at higher risk from exposure to toxic chemicals than most adults. A UNEP study of 300 schoolchildren near Dandora (where there is a 30 acre unrestricted dumping ground just 8 kilometres from Nairobi) found that about 50% had respiratory problems, and 30% had blood abnormalities signalling heavy-metal poisoning due to their proximity to poor e-waste recycling practices and open waste burning. The range of toxic substances contained

in e-waste are a risk to human health, that also persist in the environment and bio-accumulate, such as persistent organic pollutants (e.g., brominated flame retardants such as Polybrominated Diphenyl Ethers (PBDEs), Polychlorinated Biphenyls (PCBs), Hexabromocyclododecane (HBCD), and dioxins and furans (PCDD/Fs, PBDD/Fs) and heavy metals (e.g., lead, nickel, chromium, mercury). Recycling makes business sense because end of life electrical and electronic equipment contain valuable resources and precious metals such as gold, silver, copper, steel, aluminium, and plastics.

- 10.** Kenya has been undergoing rapid ICT transformation in recent years, attempting to bridge the “digital divide” by importing second-hand or used computers, mobile phones, monitors, printers from developed countries. While there is estimates and anecdotal evidence that point to an increase in e-waste quantities in the country over the past few years, particularly given the import of inexpensive, used equipment as mentioned above, there is a significant lack of data on e-waste in the country. This is aggravated by the current system of gathering information in which second-hand and waste products are by and large invisible to national statistics in production, sale and trade-in of goods. Kenya, like most SSA countries, has inadequate systems in place for the separation, storage, collection, transport, and disposal of waste. There is also insufficient legislation dealing specifically with e-waste aggravated by lax enforcement of laws dealing with waste more generally.
- 11.** *Trends in Import and Domestic Generation of E-waste:* The exact situation with regard to e-waste quantities in Kenya also remains unclear due to the fact that a comprehensive baseline on e-waste in Kenya has never been undertaken further compounding the problem of e waste recycling. Available data on e-waste arising in Kenya is poor and insufficient and estimation techniques are inadequate but required for extension of known data to national coverage and this impedes recycling efforts and abilities. According to Kenya's National Environment Management Authority, each year the country generates 3,000 tons of electronic waste. In recent years, the Kenyan government has rolled out an e-government program to promote use of information and communication technology (ICT) in all sectors. The resultant waste from their usage has over the years accumulated, and now poses a threat to the environment. Kenya lacks an up to date national inventory of e-waste quantities and this presents a general challenge in terms of tackling the management of the same. The determination of and availability of e- waste quantities is a significant step in the overall management of e-waste including investing in e-waste as a sector.
- 12.** According to a study conducted by UNEP in 2009, it was estimated that the current e-waste generated annually in Kenya was 11,400 tonnes from refrigerators, 2,800 tonnes from TVs, 2,500 tonnes from personal computers, 500 tonnes from printers and 150 tonnes from mobile phones (UNEP & UNU, 2009). This is old data and it is envisaged that the quantities of e-wastes has increased since this time therefore making a case for and justification to conduct a new inventory. A mass flow study carried out in 2007 by Kenya ICT Action Network showed that: 1,513 tonnes of electronics entered the market. The consumer in addition to receiving 1,489.4 tonnes also received 151.3 tonnes from the second hand market. Other sources also indicate that Kenya has reached a mobile penetration rate of more than 63 percent and an internet penetration of more than 18.6 percent. The number of internet users in (2007) was estimated at 10.2 million. The number of ICT companies along the sector increased to more than 4,000 companies. Moreover, many shops and kiosks also resell ICT related services; especially services and products relating to the mobile phone. ICT is being extensively used in the education, health,

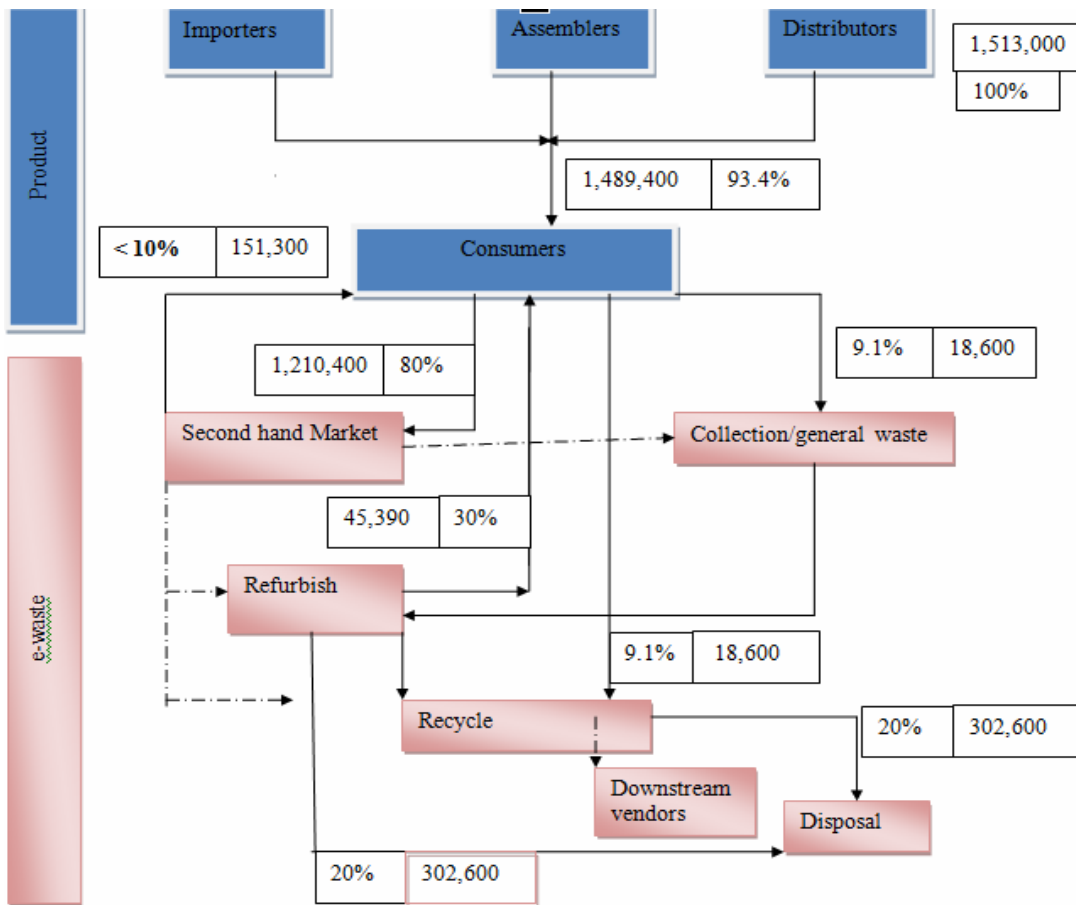
industrial, trade and communication sectors. Private sector has been installing heavy computing equipment and data centers, mainly mobile operators, banks, and Manufacturing sector companies. From the statistics, the consumers are likely to: Dispose of 1,210.4 tonnes in the second-hand market; Dispose of 18.6 tonnes to collectors or to be refurbished; and Disposes of 18.6 tonnes directly to recyclers.

The Extent of Local Capacity Recycling in Kenya

| Material Fraction | Recycling | Possible downstream partners |
|---|------------------|---|
| Plastic | Yes | EACR Facility dismantles all e-waste equipment and removes the plastic, which is sorted and shipped to UK. The informal sector also buys e waste plastic from dealers in e waste, which is recycled. |
| Ferrous Metal | Yes | EACR Facility dismantles e-waste and sends ferrous metals to UK for extraction and refining. However, other players in this sector sell to partners in industrial area, who then melt and supply them to metal and scrap dealers. Most operate informally. They are members of the Kenya Iron and Scrap Metal Association (KISMA) |
| Aluminum | Yes | EACR Facility dismantles e waste and ships the aluminum to UK. However, locally, other players extract the aluminum from computers, which sold to dealers in the industrial area. |
| Copper | Yes | EACR Facility is capable of sorting, dismantling e-waste and then sends to UK for extraction. |
| Printed wiring boards (precious metals) | Yes | EACR facility has the capacity to dismantle and sort motherboards. Currently extraction of metals from the board is undertaken in UK. |
| CRT tubes (containing lead, beryllium, phosphor etc.) | Yes | EACR Facility has the capacity to dismantle and recycle CRT tubes in UK. |

13. In Kenya, consumers obtain electronic equipment (e.g., computers) either from an importer or a manufacturer who supplies directly to the market or through retailers. After the end-of-life of the computer, the disposal process commences. In Kenya, even though a draft e-waste regulation has been developed, there is still no established e-waste framework, or formal or informal collection system to collect e-waste. In most cases, once the end-of-life of electronic equipment is attained, it may be fed into the second-hand market. The second-hand market seeks to extend the life cycle of the computer by refurbishing it. This may involve changing parts of the computer to make it operational. Once repaired, the computer is sold to a consumer as a second-hand computer and the process is repeated. When the computer is deemed to be beyond repair, it is dismantled to recover the component material.

Mass flow diagram for the stakeholders of the field study (units in kg)



Source: World Bank Case Study on Kenya (2014).

14. The mass flow diagram suggests that the consumer holds excessive stock and structures are not developed enough to handle e-waste disposal, and therefore cause a ‘drag’ on waste volumes. There are huge amounts of old technology or e-waste being held by the consumer. The consumer has a total of 1,640 tonnes comprising of the new equipment and what comes from the second-hand market that could be disposed. While 1,210.4 tonnes is disposed in the secondhand market, the documented outflow to refurbishes and collectors are much lower, suggesting consumers hold back a huge stock. According to this study, consumers confirmed this position indicating that a lot of the old technology is held in storage due to a lack of clear strategies and processes for disposal. Disposal options vary widely depending on the user. As mentioned above, government and parastatals have to bond the computer and invite competitive tenders for disposal of e-waste as scrap in line with procurement procedures. This is a slow process and cumbersome. The study further revealed that obsolete computers are still in government stores. Private sector corporations often donate the computers as charity to deserving users. Other institutions dump them in repair shops, which mean repair shops have huge quantities of unusable computers and do not know how to handle the waste. Collector, refurbishers and the recycling infrastructures are generally not developed and therefore the flow down the value chain has much lower volumes.

- 15.** The above model anticipates projected e-waste levels for IT that was sold into the market in 2007. The estimates below are based on the national stock of computers estimated from previous studies across the various sectors, in particular Waema (2007). This includes the Government stock of PCs in use. Companies typically depreciate computers over a three-year period. From this point the computer is amenable for disposal. Field research indicates that most of the disposal takes place after up to five years of use or later. This suggests a disposal rate of the 20 percent of new stock per year. The research further indicated that the disposal by the first owner usually involves feeding it to the second-hand market. Based on the above, a final disposal rate of 10 percent is assumed. This means that it is reasonable to estimate of an annual e-waste volume of 2,984.35 tonnes. This is the challenge that e-waste management strategy needs to address.
- 16.** The resultant downstream market is not fully developed to address both economic opportunities and safety and environmental concerns raised by e-waste. According to the findings of this study, there is only one company (East Africa Compliant Recycling) Facility that has the capacity to sustainably extract all of the value from e-waste. Local industries, however, have the capacity to recover plastics, ferrous metals and aluminum, and sell the same to various users, including the informal market. The local industries however, lack capacity to deal with copper, precious metals, and CRTs and other hazardous fractions.
- 17.** Kenya is currently working to incorporate e-waste control and management specifically into its legislative framework. Currently existing legislation and its international agreements, such as the Basel, Bamako and Stockholm conventions cover certain aspects of e-waste management. However, Kenya has prepared guidelines specifically for e waste management and in 2013 further completed the development of draft e-waste regulations, which are yet to come into force. Further, the Environmental Management and Coordination (Waste Management Regulations) regulations 2006, may apply to electronic waste where they can be classified as hazardous waste. In 2013, Kenya completed the development of e-waste regulations, which are still considered as draft pending their enactment into law after their publication in the official gazette. Key highlights of the regulations include among others: Registration of Producers; Producers Register Database; Annual compliance certificate of Producers; Producer Responsibility; Responsibilities of Recyclers; Responsibilities of Generators; Import of Electrical and Electronic Equipment; and Prohibitions.
- 18.** Lack of effective regulatory frameworks and infrastructure for sound hazardous waste management, including safe disposal and recycling is a critical barrier to e-waste recycling in Kenya. The lack of clear disposal mechanisms has resulted in excessive stocks being held by the consumer and further lack of well-developed structures to handle e-waste disposal is also causing a ‘drag’ on waste volumes. For example Government ministries and departments have to bond the computers and invite competitive tenders for disposal as scrap in line with procurement procedures. The process is slow and results in obsolete computers being held in government stores. Collectors, refurbishers and the recycling infrastructures are generally not developed and therefore the flow down the value chain has much lower volumes. Key players with regard to e-waste generation, management and disposal include a variety of ministries and private and public sector partners. Table A2.2

below outlines the key institutions, roles and constraints of these actors both up and downstream in the sector.

Mapping of Institutions, Roles and Constraints in E-Waste Management

| Institution | Role | Challenges/Constraints |
|---|---|--|
| Government Ministries and Department | | |
| Ministry of Environment | Policy formulation on e-waste management | Inadequate capacity and resources for e-waste policy formulation |
| Ministry of Industries | Policy formulation on IT Sector development | Inadequate resources for e-waste policy formulation |
| Ministry of Health | Policy formulation on e-waste management | Inadequate resources for e-waste policy formulation |
| Ministry of ICT | Policy formulation on e-waste management | Inadequate capacity and resources for e-waste policy formulation |
| NEMA | Enforcement of regulations, awareness creation, | Inadequate funds for e-waste management enforcement, awareness creations, |
| Kenya Bureau of Standards | Standards and specifications development for IT sector and e-waste management | Inadequate capacity and resources |
| Kenya Revenue Authority | Enforce custom regulations related to import of electronic equipment | Limited capacity and technology to inspect all imports of electronic equipment to determine whether they are old or e-waste; |
| Civil Society Organizations | | |
| Computer for Schools I-Hub, ICT Action Network | Create awareness on e-waste problem; Influence Policy and regulation on e-waste management; | Lack data on e-waste quantities |
| Private Sector | | |
| Recycling Companies | Recycle/refurbish e-waste | Inadequate regulatory and legal framework for operations; Low public awareness on e-waste as a resources; |
| Equipment Manufacturers (HP, Dell, IBM) | Extended Product Responsibility | Inadequate regulatory and legal framework for operations; Low public awareness on e-waste as a resources. |

19. The Ministry of Environment (MoE) and the National Environmental Management Agency (NEMA) both have a legislative mandate that provides authority with regard to management and control of e-waste. The MoE has the mandate to promote, monitor and coordinate environmental activities and enforce compliance of environmental regulations and guidelines. In respect to e-waste therefore, it has a significant role ensuring the same in relation to e-waste related activities as well as enforcing compliance to the e-waste regulations and guidelines. The Ministry of Information, Communication and Technology's (MICT) recognition of the potential challenge posed by e-waste is a positive example of upstream awareness in government that can mitigate the future accumulation of e-waste. The MICT included a clause in its 2006 policy document that specifically addresses the issue. The ICT policy promulgated by the MICT in 2006 is cognizant of e-waste and states that "...As a prerequisite for grant or renewal of licenses, applicants must demonstrate their readiness to minimize the effects of their infrastructure on the environment. This should include provision of appropriate recycling/disposal facilities for waste that may contain toxic substances." While the intention has not been incorporated in

ICT regulations to make it binding, the Universal Licensing Framework to be implemented by the CCK from July 1st, 2008 takes a step towards enforcing this statement of intent.

- 20.** Specific information on the environmental and socio-economic impacts of e-waste in Kenya is extremely limited due to a lack of data. However, little information is available on issues such as the effects on the socio-economic well-being of workers in the informal sector; the size of the scrap/processing sector, i.e., the number of refurbishers still operating outside vs. inside the center; effects on the flow of e-waste into and within the country; improvement of human and environmental health; condition of storage facilities, and disposal and emissions from the EACR etc. There is still an inadequate legal and regulatory framework for control and management of e-waste, as well as inadequate funds for enforcement and awareness raising at both the MoE and NEMA. A clear baseline data and monitoring of effects are needed to track the success of the recycling center, the effectiveness of the new legislation and other schemes.
- 21.** E-waste management practices in Kenya have until very recently been informal, mainly involving collection and refurbishing and resale which is common in the informal sector. There appears to be limited dumping of e-waste in dumping sites as a result of the very active informal sector that collects the wastes before it reaches dumping sites. Other management practices include voluntary take back schemes piloted by the private sector. And, in 2013, an e-waste recycling plant was established in Nairobi. East Africa Compliant Recycling (EACR) is operating Kenya's first e-waste recycling facility, operating to international health, safety and environmental standards and establishing a local, sustainable IT e-waste recycling industry. The EACR was designed as a scalable model for e-waste recycling. It was established in Mombasa in October 2011 as a pilot project with funding from Hewlett-Packard. It is the first facility of its kind in East Africa to test a practical approach to e-waste recycling. The objectives behind its establishment were to: Analyze and measure volumes of e-waste returned; Establish the process to safely separate the products into parts; and Identify facilities and markets to process all the resulting dismantled materials. Since beginning official operations, the EACR remains the only recycling facility in Kenya to accept, dismantle and separate all e-waste components and not just the valuable resources. Plastics, glass, batteries - everything - are all disposed in accordance with the highest international criteria while generating local income and employment opportunities. Until now, the facility receives end-of-life IT from business and public sector customers, as well as from the informal sector for recycling. EACR facility offers its workers advice on handling e-waste containing hazardous materials such as lead and cadmium.
- 22.** The facility undertakes the following activities: Collection; Transportation; Sorting; Dismantling; Initial Size Reduction; Secondary Size Reduction; Overband Magnet; Metallic & Non-Metallic Content. The EACR facility is currently not recycling any items in Kenya and instead ships all the dismantled, shredded and sorted items to UK for recycling due to the absence of a refinery with the capacity to recycle and extract precious metals from the wastes. However, there are plans by EARC to establish a refinery in Kenya in the near future capable of recycling the e-waste. Refurbishment has been a growing business area in Kenya. Computers for Schools Kenya (CFSK), which is a local NGO dealing in the refurbishment of computers, established a niche in the sector, including recycling. Material fractions in the form of plastics, ferrous metals and aluminum are easily separated and have found a market mainly in the informal sector, where they are melted

and used in the production of agricultural equipment. Before the entry of EACR there was no specialized equipment in the country for handling material fractions like copper, printed circuit boards (PCBs), CRT tubes and other hazardous fractions such as lead, mercury and lithium. In the case of CFSK these fractions were being exported to Europe and Asian countries where there are specialized facilities but this has now changed and they are being sent to EACR facility in Nairobi instead. It is unclear from the available data as to the socio-economic impact of the change.

23. Safaricom Ltd, a mobile network provider throughout Kenya, developed a partnership with CFSK to establish a voluntary take back scheme for recycling and End-of-Life EOL management designed to make use of Safaricom retail centers all over the country as collection points. The scheme has however not been successful and the response from the consumers was very poor, noteworthy is the fact that people did not return the disused phones as was expected. Some of the challenges to EOL management include: Convenience of drop off points (based on location of collection points); Competition for resources with refurbishers who use the old phones to meet the demand for second hand phones; Consumer willingness to participate: it was noted that consumers expect to be given incentive to return the EOL gadgets/phones. It was also noted that there is ignorance/lack of awareness on the part of consumers that has resulted in many used phones/other e-waste being kept in storage (at homes, offices, repair shops etc.); and Lack of mandatory collection schemes.
24. Lack of effective regulatory frameworks and infrastructure for sound hazardous waste management, including safe disposal and recycling is a critical barrier to e-waste recycling in Kenya. The lack of clear disposal mechanisms has resulted in excessive stocks being held by the consumer and further lack of well-developed structures to handle e-waste disposal is also causing a 'drag' on waste volumes. For example Government ministries and departments have to bond the computers and invite competitive tenders for disposal as scrap in line with procurement procedures. The process is slow and results in obsolete computers being held in government stores. Collectors, refurbishers and the recycling infrastructures are generally not developed and therefore the flow down the value chain has much lower volumes. The existing system for managing e-waste in Kenya is generally not sustainable because mechanisms for collecting, sorting, reuse, refurbishing, repairing, and remanufacturing are not well developed and/or implemented. Problems associated with market issues, obsolescence issues, feedstock collection, feedstock management, and product-design will need to be addressed in order to generate further interest in e-waste recycling.

Proposed alternative scenario

Under the proposed program this child project will deliver at the national level and engage at the regional level through the regional coordination child project

Component 1: Institutional strengthening, knowledge and capacity building

25. This component will support Capacity building activities which include (a) benchmarking of key NEMA staff to acquire best practices on waste management for reduction of releases of POPs from unsound e-waste management practices, and ensure appropriate skills

transfer; (b) sensitization workshops on waste management, including e-waste, with EEE and E-waste management stakeholders in the value chain country-wide; (c) support to NEMA staff supporting waste and e-waste management regulations; and (d) streamlining Customs coding with appropriate training of the Customs and borders inspectorate to curtail entry of illicit e-waste in the first place. In addition, the component will ensure both national level stakeholders coordination and participation in the regional learning and knowledge sharing activities on the harmful chemicals agenda. This will contribute to strengthening the regional partnerships and collaboration. It will support strengthening environmentally sound management of e-waste regulations and guidelines and development of systems for monitoring and enforcement, relevant to waste management with a focus on e-waste. The component will also review existing documentation and undertake a country-wise situation analysis on waste, including inventory of major toxic pollutants emanating from the sector; assessment of environmental health implications of harmful chemicals and waste and options for risk management; and economic analysis of the waste management sector for the national economy.

Component 2: Support for policy dialogue and regulatory enhancements

26. The component will support Government's efforts in strengthening the current environmental policies and regulations and capacity to monitor; screen and evaluate health and environmental risks associated with e-waste. The component will assist development of strategy for promoting the reduction of emissions and releases of, and exposure to, harmful chemicals and hazardous waste. Such a strategy would include gathering of health data, training for health-care workers and awareness-raising through health facilities. Particular attention will be taken to prevent the exposure of vulnerable populations, particularly children and women of child-bearing age, especially pregnant women, to harmful chemicals and dissemination of information to different actors and affected communities.

Component 3: Demonstrating application of technological tools and economic approaches

27. This component will support the initiation of a pilot project in a selected county in Kenya on implementation of integrated waste management approach to reduce releases of POPs from e-waste through improving source reduction/reuse, collection, transportation, and disposal/recycling, and following Articles 5 and 6 of the Stockholm Convention and related COP guidelines and guidance. This will start with (a) analysis of the current plans, (b) inventory information on toxic substances like PBDEs production, importation and usage and, (c) priorities and institutional capacity (including private sector) for the selected county. Such analysis and inventory will ensure that appropriate solutions are selected and the basic waste management services are in place and operating, before more advanced approaches are considered. Based on the identified priorities, the infrastructure investments will be designed and implemented, focusing on addressing the gaps in the collection and disposal system. This component will also support piloting e-waste management in a selected county in Kenya – starting with capacity building for all relevant stakeholders in the county (including government, CSOs, and private sector), investment in infrastructure for the entire e-waste management cycle from generation, to collection, transportation, setting up of collection centers or transfer stations and treatment (recycling) facility. It includes developing protocols and methodologies for assessment of environmental health risks associated with e-waste based on health and environmental data, knowledge, risks

and impacts. The Bank is envisioning to engage stakeholders already working in the field of e-waste management, including CFSK, WEEE, HP and others to leverage and eventually mainstream the existing good practices.

28. Regulatory enhancements for Environmental and Social management will include assistance to strengthen existing legislations with respect to recycling and disposal; financing system for ewaste recycling and disposal (possibly through a prepaid fee, producer responsibility etc); use of cleaner technologies (dismantling and Recycling); and awareness raising and information dissemination.

Incremental/additional cost reasoning and co-financing

29. The World Bank has a number of ongoing set of urban sector investments which are dedicated to infrastructure investments and improved service delivery. Nairobi Metropolitan Services Improvement Project (NaMSIP) (amounting to USD 300 million) has an objective to strengthen urban services and infrastructure in the Nairobi metropolitan area. This will be achieved, among others, by supporting improvements in integrated solid waste management; and helping to improve service delivery by strengthening the current and future entities responsible for service delivery, including the central ministry, current local authorities and future county governments, utilities and other service providers, and possible future metropolitan authorities responsible for planning, transport, and other services.
30. NaMSIP Component 1 is focusing on *Institutional reform and planning*, which will assist existing local authorities, including county governments, within the Nairobi metropolitan area. Component 2 includes *Local government infrastructure and services*, and finances small-scale priority urban infrastructure in 13 selected urban areas in the Nairobi metropolitan area, which includes waste management and street cleaning. Component 3 is focusing on *Metropolitan infrastructure and services*. This component assists in providing large-scale metropolitan infrastructure in the areas of solid waste, transport, and sewerage services. On solid waste, the component supports the preparation and implementation of an integrated metropolitan-wide solid waste management (ISWM) strategy. The ISWM strategy will identify the policy, institutional, legal, and regulatory changes required to create a well-functioning solid waste system. The project will support design and implementation of such reforms.
31. Another ongoing project is Kenya Municipal Program (KMP amounting to USD 165 million) is addressing strengthening local governance and improve service delivery in selected counties in Kenya which includes institutional reforms, capacity building, studies for sanitary landfills and investments in infrastructure.
32. *The KMP includes Component 1 focusing on Institutional strengthening which supports institutional strengthening, capacity building, and policy development at the national and municipal levels to facilitate decentralization and build a capable and accountable local government system; Component 2 focusing on Participatory strategic urban development planning which provide support for: (a) preparation of strategic urban development plans—including physical structure plans and capital investment plans—developed in consultation with stakeholders; (b) community mobilization and participation in these planning processes and in other program-related initiatives; and (c) establishing and strengthening municipal planning offices; and Component 3 on Investment in infrastructure and service*

delivery which support investments in critical urban infrastructure and services. The financing under the Kenya Municipal Program included solid waste facilities, motorized and non-motorized transport facilities (including bus parks, access roads, sidewalks and paved paths), street lighting, markets, storm water drainage, disaster management and prevention (facilities and equipment), public parks and green spaces, which create an enabling environment to improve environmental health. **The GEF co-financing will leverage IDA project's effort into the institutional arrangements and developing urban infrastructure to maximize the results on service delivery and improving environmental health.**

33. Lastly, Kenya Informal Settlement Improvement Project (KISIP- USD 110 million) approved in 2011 is targeting improvement of living conditions in informal settlements in several urban centers in Kenya. The project is improving infrastructure based on plans developed in consultation with the community, which includes four components: Component 1 focusing on strengthening institutions and program management by supporting institutional strengthening and capacity building of the Ministry of Housing, the Ministry of Lands, and the selected municipalities. The component also finances the management activities associated with program implementation and establishment of a monitoring and evaluation system; *Component 2* on enhancing tenure security in urban informal settlements; *Component 3 on infrastructure and service delivery which* support investment in infrastructure; and Component 4 on planning for urban growth. The last component support planning and development of options that facilitate the delivery of infrastructure services, land, and housing for future population growth.
34. The GEF financing will cater to improving the environmental health amongst the human settlement by focusing on improving municipal infrastructure. The KISIP identified sustainable management of waste as a significant factor in achieving sustainability of projects infrastructure investments. The GEF program will complement the IDA project by supporting the capacity building activities for NEMA and relevant County level staff under the new Kenya Devolution Support Programme and ongoing Institutional Development Fund support for strengthening environmental management compliance in the country.

Global environmental benefits

35. The overall socioeconomic benefit of the project is derived from the elimination of POPs releases from unsound e-waste management and recycling practices that have significant negative impacts on environment and human health, following the provisions of articles 5 and 6 of the Stockholm Convention on POPs. The associated risk reduction at both a local and national level will positively impact the productivity of populations and reduce the financial burden imposed by potentially degraded public health, as well as contributing to general wellness, economic development and quality of life. This is particularly true for vulnerable parts of the population and for maternal health that would be improved by reduced POPs and other toxics exposure. More specific socioeconomic benefits from the project are associated with its proactive approach to integrating the informal sector into a properly managed and funded management system.

A.2. *Stakeholders. Will project design include the participation of relevant stakeholders from civil society and indigenous people? (yes /no) If yes, identify key stakeholders and briefly describe how they will be engaged in project design/preparation:*

36. The key stakeholders in such an integrated project will include the Government agencies such as Customs Control, National Environmental Management Authority of Kenya, the Ministry of Environment and Natural Resources and Non-governmental organizations, informal recyclers, private sector (original equipment manufacturers). Special attention will be given to ensure the participation of indigenous people and local communities at the site level.

A.3 Risk. Indicate risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the project design (table format acceptable):

| Risk Category | Rating and Risk Management |
|--|----------------------------|
| Sector Strategies and Policies | Low |
| | |
| Technical Design of Project or Program | Moderate |
| | |
| Institutional Capacity for Implementation and Sustainability | Moderate |
| | |
| Fiduciary | Substantial |
| | |
| Environmental and Social | Substantial |
| | |
| Stakeholders | Substantial |
| | |
| Overall | Substantial |

A.4. Coordination. Outline the coordination with other relevant GEF-financed and other initiatives:

37. The project will utilize and strengthen existing structures for national coordination to avoid duplication and to ensure coordination between the countries. The project will build on, and complement the ongoing NIP development process and will partner with the other agencies, including UNIDO, UNDP and UNEP, which are implementing GEF projects on chemicals and waste and POPs.

- Integrated Health and Environment Observatories and legal and institutional strengthening for the Sound Management of chemicals in Africa (African ChemObs)
- Continuing Regional Support for the POPs Global Monitoring Plan under the Stockholm Convention in the Africa Region
- Enabling Activities to Review and Update the National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants
- Development of Minamata Convention on Mercury Initial Assessment in Africa
- Environmentally Sound Management of Municipal and Hazardous Solid Waste to Reduce Emission of Unintentional POPs

- Promotion of BAT and BEP to Reduce uPOPs Releases from Waste Open Burning in the Participating African Countries of COMESA-SADC Subregions
- Minamata Convention Initial Assessment in Francophone Africa I
- Sound Chemicals Management Mainstreaming and UPOPs Reduction (Kenya)
- Improve the Health and Environment of Artisanal and Small Scale Gold Mining (ASGM) Communities by Reducing Mercury Emissions and Promoting Sound Chemical Management (Senegal)

B.1 Is the project consistent with the National strategies and plans or reports and assessments under relevant conventions? For biodiversity related projects, please reference the Aichi Targets that the project will contribute to achieving. (yes /no). If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, etc.:

38. The project is fully aligned with Kenya's revised and updated NIP recently submitted to the Stockholm convention secretariat, and which shows the significance, and the priority attached to POPs releases from e-waste. The project will directly contribute to Kenya's Vision 2030, which calls for providing clean and secure environment. The project is also well aligned with the Government of Kenya's emerging drive to improve waste management in the country particularly, e-waste management strategies and plans.

ANNEX A: **5. Senegal**

PART I: PROJECT INFORMATION⁴²

| | |
|-----------------------------|--|
| Project Title: | Reducing Environmental health risks from the release of POPs and other toxic chemicals in Senegal |
| Country(ies): | Senegal |
| GEF Agency(ies): | WB |
| Other Executing Partner(s): | Ministry of Environment |
| GEF Focal Area(s): | Chemicals and Wastes |

A. FOCAL AREA STRATEGY FRAMEWORK AND OTHER PROGRAM STRATEGIES⁴³:

| Objectives/Programs (Focal Areas, Integrated Approach Pilot, Corporate Programs) | Trust Fund | (in \$) | |
|--|------------|-----------------------|--------------|
| | | GEF Project Financing | Co-financing |
| CHEM-2 Program 3 | GEFTF | 5,504,587 | 21,100,000 |
| Total Project Cost | GEFTF | 5,504,587 | 21,100,000 |

B. CHILD PROJECT DESCRIPTION SUMMARY

| Project Objective: Reduce Environmental health risks by reducing the release of unintentional POPs and other toxic chemicals and establish an ESM of urban waste. | | | | |
|--|------------------------------|--|-----------------------|--------------|
| Project Components | Financing Type ⁴⁴ | Project Outcomes | (in \$) | |
| | | | GEF Project Financing | Co-financing |
| Institutional strengthening, Knowledge and Capacity building | TA | <p><i>Outcome:</i> uPOPs released from open burning of urban and other toxic wastes in uncontrolled and unregulated landfill sites minimized</p> <p><i>Indicative targets:</i> + Assessment on the existing law and regulations on the sound management of harmful chemicals and wastes, + Appropriate BAT/BEP established and</p> | 1,504,587 | 3,300,000 |

⁴² This Concept Note is intended to convey whatever preliminary information exists at this stage on a child project and that is indicative of how it will contribute to the overall Program.

⁴³ When completing Table A, refer to the Program Results Framework, which is already mapped to the relevant [Focal Area Results Framework](#) in the [GEF-6 Programming Directions](#).

⁴⁴ Financing type can be either investment or technical assistance.

| | | | | |
|--|----|---|-----------|-----------|
| | | <p>implemented to reduce the release of POPs, + Legal and institutional tools in place to promote ESM of resources reduction, reuse, recycling and composting, + Information, education and communication strategy developed to disseminate the policy and guidelines on harmful chemicals and wastes management to the stakeholders.</p> | | |
| Support for Policy dialogue and Regulatory Enhancements | TA | <p><i>Outcome:</i> Policy framework for management of harmful chemicals</p> <p><i>Indicative targets:</i> +Guidelines and checklists in place which are easily accessible and understood by different actors +Effective and wide-spread communication of the revised policy *Successful implementation of the project and lessons learned disseminated +Project intervention monitored and reported +Project progress evaluated</p> | 1,000,000 | 7,000,000 |
| Demonstrating application of technological tools and economic approaches | TA | <p><i>Outcome:</i> Reduced environmental health risks from POPs releases from urban waste in Mariste and Dalifort municipalities</p> <p><i>Indicative targets:</i> +Reduced open dumping and burning of waste +Reduction of releases of UPOPs</p> | 2,724,771 | 9,800,000 |
| | | | | |

| | | |
|---|------------------|-------------------|
| Subtotal | 5,229,358 | 20,100,000 |
| Project Management Cost (PMC) ⁴⁵ | 275,229 | 1,000,000 |
| Total Project Cost | 5,504,587 | 21,100,000 |

For multi-trust fund projects, provide the total amount of PMC in Table B, and indicate the split of PMC among the different trust

C. CO-FINANCING FOR THE PROJECT BY SOURCE, BY TYPE AND BY NAME

| Sources of Co-financing | Name of Co-financier | Type of Co-financing | Amount (\$) |
|---------------------------|--|----------------------|-------------------|
| World Bank | Senegal Urban Water Sanitation Project | Loan | 20,800,000 |
| Recipient Government | Government of Senegal | In-Kind | 300,000 |
| Total Co-financing | | | 21,100,000 |

D. TRUST FUND RESOURCES REQUESTED BY AGENCY(IES), COUNTRY(IES) AND THE PROGRAMMING OF FUNDS ^{a)}

| GEF Agency | Trust Fund | Country/Regional/Global | Focal Area | Programming of Funds | (in \$) | | |
|----------------------------|------------|-------------------------|---------------|----------------------|---------------------------|------------------------------|------------------|
| | | | | | GEF Project Financing (a) | Agency Fee (b) ^{b)} | Total (c)=a+b |
| WBG | GEFTF | Senegal | Chemicals and | POPS | 5,504,587 | 495,413 | 6,000,000 |
| Total GEF Resources | | | | | 5,504,587 | 495,413 | 6,000,000 |

- a) No need to fill this table if it is a single Agency, single Trust Fund, single focal area and single country project.
- b) Refer to the [Fee Policy for GEF Partner Agencies](#).
- c) If Multi-Trust Fund project :PMC in this table should be the total amount; enter trust fund PMC breakdown here ()

PART II: PROJECT JUSTIFICATION

PROJECT

OVERVIEW

A.1. Project Description. Briefly describe: 1) the global environmental and/or adaptation problems, root causes and barriers that need to be addressed; 2) the baseline scenario or any associated baseline projects, 3) the proposed alternative scenario, with a brief description of expected outcomes and components of the project, 4) incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing; 5) global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF); and 6) innovation, sustainability and potential for scaling up.

Background

1. Dakar, capital city of Senegal, represents only 0.28% of national territory. It is home to 25% of the total population and over 50% of the urban population. Also, over 90% of industrial activities are concentrated in Dakar. Because of its position, it exerts an attraction

⁴⁵ For GEF Project Financing up to \$2 million, PMC could be up to 10% of the subtotal; above \$2 million, PMC could be up to 5% of the subtotal. PMC should be charged proportionately to focal areas based on focal area project financing amount in Table D below.

on people in search of a better living and working conditions. The “Maristes” district is crossed by two lakes that are an extension of the Niayes area in the region of Dakar. This wetland system extends over 1,700 m long and 80 m wide and plays an important ecological role. Since the 80s the exponential urban growth of Dakar starts and leads to a significant loss of biodiversity. The rapid growth of the population in the Senegalese capital has consequences in the environmental degradation. According to the National Statistics Agency, in 2013, the population density is 5,704 people per km². The mad rush for land, in a context of urban expansion dominated by the irregular and informal housing, has occurred most often at the expense of Niayes, destroying at the same time the functions of these special wetlands as reservoir, buffer, filter and horizontal flow regulator. The long period of drought has coincided with these transformations, and has given the illusion that all the land could be made safe for residential areas. Despite all urban plans, pre and post-independence, Dakar area is experiencing serious difficulties related to climate change and the rapid and uncontrolled urban growth, especially in the “Maristes and Dalifort” area. These spaces are being attacked by the strong urban pressure through a sudden transformation process of their ecosystem. Several studies have shown that between the late 1980s and mid-1990s, most of the natural areas were transformed to residential areas. These conversions of wetlands to residential areas in the “Maristes and Dalifort” area are made without taking into account the soil characteristics and, have seriously affected some activities such as market gardening. Dunes and retention tanks (real water tank), have disappeared after earthworks and the establishment of landfills facility in order to develop residential area. Both lakes continue to maintain the past "green" but the consequences are the fact that they remain mosquito breeding sites.

- 2. Senegal has ratified the Stockholm Convention in May, 2003 and developed its NIP on April 26, 2007** with the assistance from the United Nations Environment Programme (UNEP) as GEF Implementing Agency, and has already submitted the review and update of its NIP as part of its commitment under the SC. Under the Stockholm Convention, a total of 26 chemical substances are listed as POPs, including pesticides (such as DDT), industrial chemicals (such as polychlorinated biphenyls, PCBs) and unintentional by-products of industrial processes (such as dioxins and furans). The last group of chemicals is often called unintentionally produced POPs (UPOPs).

Baseline scenario

- 3.** Recently, Senegal has launched a new reform: Third Act of Decentralization articulated within the Senegal Emerging Plan, the current single repository of environmental and social economic development of the country. This reform intends to transfer full responsibilities to local governments for a better and sustainable development of their localities. In 2014, a national tour initiated by the Coordination Unit of Solid Waste Management (UCG) has identified and characterized, in 48 towns, more than 1,700 unregulated dumpsites due to a lack of appropriate facilities. There is a presence of waste pickers or scavengers on mixed solid waste sites, with open burning also practiced and there is no awareness of hazardous waste handling.
- 4.** In the Mariste and Dalifort areas, waste not collected by the municipalities is dumped into the lakes or piled up around by the residents or cart drivers who sometime collect any kind of hazardous waste from everywhere for a sum of money to dump it into the lakes or around. This results to a public health problems such as plagues of flies, and mosquitoes

and the spread of infectious diseases. Since waste incineration facility is not available open burning, of non-segregated urban wastes and other toxic wastes (including e-waste, heavy metal such as lead and mercury), constitutes an undesirable option for waste management. These conditions result in incomplete combustion and release of unintentionally produced POPs.

5. This situation calls out all stakeholders given the fact that the main issue is from a lack of coordination, consultation and, implementation, as well as monitoring and evaluation of the recommended measures from the various land use planning documents. This project is justified by the need to involve all actors and stakeholders in the context of an inclusive dialogue for an environmental sound management to address harmful chemicals and to establish an ESM of urban waste and to contribute to reduce environmental health risks by reducing the release of unintentional produced POPs and other toxic chemicals. Indeed, waste management is everyone responsibility and not the only obligation of the municipality. Therefore, an effective collaboration of the local government, the municipalities, the private sector, and the residents as well as civil society organizations, is required. This will make these sites a landscape and cultural heritage and promote income generating activities, be a tourist site with recreational activities (swimming, sailing, hiking / walking) because they are naturally and potentially places for relaxation, and sighting. The World Bank's "Strategic Planning Guide for Municipal Solid Waste Management" will be referred to effectively implement this project as well as lessons learned from past projects which can provide useful information that can increase the effectiveness and efficiency.
6. There is an urgent need to reform legal frameworks for better household waste management and the creation of a sustainable self-funding system for the management of household waste. The Government of Senegal needs support for the development of infrastructure in local communities and neighborhoods and the establishment of durable, effective and reliable fee calculation systems that can be legalized and adapted by local communities to encourage citizen accountability. Public health campaigns and the provision of technical support to local communities through skills training (waste handling jobs) in collaboration with stakeholders is also required. Citizen participation through local political representatives is critical for demanding the review of outdated and weak legal framework (increase in waste and decrease in treatment options).

Proposed alternative scenario

Under the proposed program this child project will deliver at the national level and engage at the regional level through the regional coordination child project

Component 1: Institutional strengthening, knowledge and capacity building for Minimization of uPOPs from open burning of urban and other toxic wastes

7. The objective of this component is to minimize the release of uPOPs from open burning of urban and other toxic waste in unregulated and uncontrolled landfill. The project will assist the government of Senegal in ensuring that proper official guidance documents are supporting the implementation of the Stockholm convention and its amendments, specifically through the assessment and update of the existing regulations and guidelines needed to fill the legal gap for a sound management of municipal solid waste (MSP) and

hazardous waste. Appropriate BAT/BEP will be established and implemented to reduce the release of uPOPs from open burning practices. This component will support initiatives taken by the government and the municipalities of Maristes and Dalifort to establish legal and institutional tools to formalize the waste management system and to promote an environmentally sound management of resources reduction, re-use, recycling and composting. It is well recognized that the creation of an enabling policy and regulatory environment is only effective if it is accompanied by regular monitoring and facilitating of its implementation, this project component also aims to create necessary government capacity for monitoring the implementation of waste management practices through coaching approaches that help stakeholders implement guidelines and perform in accordance with national regulations. A strong awareness campaign and training at all levels will be conducted on sound management of waste and the significant impacts on human and the environment that results from the release of UPOPs (dioxins and furans) from open burning. This will include actions such as providing recommendations which can prevent and discourage improper waste disposal and improving the collection and recycling systems for example switch from dump-it-yourself to an efficient collection system. Recyclers and rag pickers will receive training on occupational health and safer practices. Information, education and communication strategy will be developed to disseminate the policy and guidelines on harmful chemicals and wastes management to key stakeholders and also to explain how the implementation of the project can lead to the creation of profitable business and job opportunities. Series of events will be held to explain to the residents why sorted waste is important and how the collection of recyclable waste discharged from homes such as used paper, cardboard, empty containers (cans, plastic bottles) can generate income. Operating an efficient, effective, environmentally sound municipal solid waste management program requires building administrative capacity for government and private sector players and technical capacity for designing, operating, maintaining, and monitoring each part of the process. In addition, the component will ensure both national level stakeholders coordination and participation in the regional learning and knowledge sharing activities on the harmful chemicals agenda. This will contribute to strengthening the regional partnerships and collaboration.

Component 2: Support to policy dialogue and regulatory enhancements

8. This component will support Government's efforts in strengthening the current environmental policies and regulations and capacity to monitor; screen and evaluate health and environmental risks associated with POPs and hazardous waste. The component will assist development of strategy for promoting the reduction of emissions and releases of, and exposure to, harmful chemicals and hazardous waste. Such a strategy would include gathering of health data, training for health-care workers and awareness-raising through health facilities. Particular attention will be taken to prevent the exposure of vulnerable populations, particularly children and women of child-bearing age, especially pregnant women, to harmful chemicals and dissemination of information to different actors and affected communities

Component 3: Demonstrating application of technological tools

9. The main objective of this project component is to support and implement actions leading to a system for reducing environmental health risks from the release of POPs and other toxic chemicals through environmentally sound management of urban waste in Mariste and

Dalifort municipalities, which can later be replicated and scaled-up nationally and regionally within Africa region. The project will focus on improving the waste value chain and in a number of measures that will reduce UPOPs releases from solid waste by strongly limiting the quantities of waste subject to uncontrolled burning: invest into improving the management of waste collection; transportation; treatment and disposal and improved recycling of waste. A waste management unit will be created or strengthened in the municipalities concerned to coordinate waste management efforts. Using existing material such as the Guidelines on best available techniques and provisional guidance on best environmental practices relevant to Article 5 and Annex C of the Stockholm Convention on Persistent Organic Pollutants appropriate actions will be developed to manage municipal solid waste and hazardous waste in a sound manner, to minimize the releases of UPOPs. This component will also look into the ways to reduce the impact of chemical pollution emanating from unregulated landfills in economic and socially acceptable manner and support the development of communication tools to raise awareness about the health costs and benefits of pollution management, including community outreach to increase public understanding and visibility of the scale and environmental health impacts. The reduction of the release of UPOPS can be expected to be very significant by the implementation of this project component with targeting activities such as the reduction of open dumping and burning of waste.

Incremental/additional cost reasoning and co-financing

10. GEF resources will assist the government of Senegal to improve significantly the collection and recycling system as well as to establish and implement appropriate BAT/BEP in order to reduce the release of uPOPs from open burning of uncontrolled landfill. GEF resources will help to increase awareness of risks related to the significant impacts on human and the environment that results from the release of dioxins and furans to human and the environment and to promote environmentally sound alternatives. To ensure cost effectiveness, the World Bank's "Strategic Planning Guide for Municipal Solid Waste Management" will be referenced to effectively implement this project as well as lessons learned from past and ongoing projects which can provide useful information that can increase efficiency. The World Bank is implementing a study, financed by solid waste GPOBA to provide related policy, investment and institutional enhancement recommendations that are necessary to improve the performance of solid waste management in each cities and also design results-based financing or output-based aid mechanisms, A particular focus of this activity will be to identify solutions approaches that improve access to sound solid waste services to poor households. Senegal has also experienced an innovative financing through public-private joint venture to deliver improved waste management services and enhanced cost efficiency. Co-financing will contribute to fund the gap analysis of the legal framework needed to support the project intervention. It will contribute to eliminate illegal dumping of hazardous waste in the area around the lakes and to develop a green space where private sectors can invest to create recreational activities, shopping center, restaurant etc.

Global environmental benefits

11. Techniques and practices implemented through this project to improving waste management will be designed to maximise UPOPs release reduction from uncontrolled

landfills, and is quite relevant not only for the environmental protection, but also for public health and sanitation promotion. Vulnerable social groups involved in waste recycling include women and young people under poverty stress, who strongly rely on this activity to secure main or additional income. Training of workers (women and men) on selected project sites will lead to diversification of waste recycling concepts in the country, by then preventing much more hazardous waste from open-burning, source of uPOPs and harmful substances. The interventions of the project will help alleviate social and economic degradation both for men and women in the sector of waste management. The enhanced sound management of municipal and hazardous waste management will eventually lead to the reduction of the uPOPs emission at the dumpsites. The project will support the informal recycling sectors and people working at the selected dump sites by providing proper safety training as well as mitigation measures of the socio-economic impacts.

A.2. Stakeholders. Will project design include the participation of relevant stakeholders from civil society and indigenous people? (yes /no) If yes, identify key stakeholders and briefly describe how they will be engaged in project design/preparation:

- 12.** The various stakeholders who would be involved would include Ministry of Environment and sustainable Development, National Commission for Chemicals Management, Ministry of Industry, Ministry of Planning, selected municipal authorities and private companies as well as other departments involved. Civil society and NGOs would be involved to contribute to the development and implementation of training, awareness and education and communication programs. Special attention will be given to ensure the participation of indigenous people and local communities at the site level.

A.3 Risk. Indicate risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the project design (table format acceptable):

| Risk Category | Rating and Risk Management |
|--|----------------------------|
| Sector Strategies and Policies | Low |
| | |
| Technical Design of Project or Program | Moderate |
| | |
| Institutional Capacity for Implementation and Sustainability | Moderate |
| | |
| Fiduciary | Moderate |
| | |
| Environmental and Social | Substantial |
| | |
| Stakeholders | Moderate |
| | |
| Overall | Moderate |

A.4. Coordination. Outline the coordination with other relevant GEF-financed and other initiatives:

- 13.** The project will utilize and strengthen existing structures for national coordination to avoid duplication and to ensure coordination between the countries. The project will build on, and complement the ongoing NIP development process and will partner with the other agencies, including UNIDO, UNDP and UNEP, which are implementing GEF projects on chemicals and waste and POPs.
- Integrated Health and Environment Observatories and legal and institutional strengthening for the Sound Management of chemicals in Africa (African ChemObs)
 - Continuing Regional Support for the POPs Global Monitoring Plan under the Stockholm Convention in the Africa Region
 - Enabling Activities to Review and Update the National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants
 - Development of Minamata Convention on Mercury Initial Assessment in Africa
 - Environmentally Sound Management of Municipal and Hazardous Solid Waste to Reduce Emission of Unintentional POPs
 - Promotion of BAT and BEP to Reduce uPOPs Releases from Waste Open Burning in the Participating African Countries of COMESA-SADC Subregions
 - Minamata Convention Initial Assessment in Francophone Africa I
 - Sound Chemicals Management Mainstreaming and UPOPs Reduction (Kenya)
 - Improve the Health and Environment of Artisanal and Small Scale Gold Mining (ASGM) Communities by Reducing Mercury Emissions and Promoting Sound Chemical Management (Senegal)

B.1 Is the project consistent with the National strategies and plans or reports and assessments under relevant conventions? For biodiversity related projects, please reference the Aichi Targets that the project will contribute to achieving. (yes /no). If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, etc.:

- 14.** The project is fully aligned with Senegal's revised and updated NIP recently submitted to the Stockholm convention secretariat, and which shows the significance, and the priority attached to POPs releases from unsound management practices for solid waste and e-waste.

ANNEX A: **6. Regional**

PART I: PROJECT INFORMATION⁴⁶

| | |
|-----------------------------|--|
| Project Title: | Coordinate action, knowledge and learning for reduction of environmental health risks from exposure to harmful chemicals |
| Country(ies): | Regional |
| GEF Agency(ies): | WB |
| Other Executing Partner(s): | WB |
| GEF Focal Area(s): | Chemicals and Wastes |

A. Focal Area Strategy Framework and Other Program Strategies⁴⁷:

| Objectives/Programs (Focal Areas, Integrated Approach Pilot, Corporate Programs) | Trust Fund | (in \$) | |
|--|------------|-----------------------|--------------|
| | | GEF Project Financing | Co-financing |
| CHEM-2 Program 3 | GEFTF | 2,293,578 | 2,500,000 |
| CHEM-2 Program 4 | GEFTF | 2,018,349 | 2,500,000 |
| Total Project Cost | | 2,018,349 | 2,500,000 |

B. CHILD PROJECT DESCRIPTION SUMMARY

| Project Objective: To coordinate participating country investments and promoting learning & knowledge exchange. | | | | |
|--|------------------------------|--|-----------------------|--------------|
| Project Components | Financing Type ⁴⁸ | Project Outcomes | (in \$) | |
| | | | GEF Project Financing | Co-financing |
| Strengthening Regional Partnerships and Policy Dialogue | TA | <p><i>Outcome:</i> Regional coordination amongst countries and partners including through RECs (ECOWAS/COMESA/SADC) to enhance institutional capacity efforts</p> <p><i>Indicative targets:</i> + Number of regional level meetings (both thematic and sub-thematic) that address mercury use and POPs exposure.</p> | 1,250,000 | 1,000,000 |

⁴⁶ This Concept Note is intended to convey whatever preliminary information exists at this stage on a child project and that is indicative of how it will contribute to the overall Program.

⁴⁷ When completing Table A, refer to the Program Results Framework, which is already mapped to the relevant [Focal Area Results Framework](#) in the [GEF-6 Programming Directions](#).

⁴⁸ Financing type can be either investment or technical assistance.

| Project Objective: To coordinate participating country investments and promoting learning & knowledge exchange. | | | | |
|--|------------------------------|--|-----------------------|--------------|
| Project Components | Financing Type ⁴⁸ | Project Outcomes | (in \$) | |
| | | | GEF Project Financing | Co-financing |
| | | + number of policy, regulations, frameworks related to mercury reduction in ASGM improved and management of urban waste and ewaste developed or updated. + Regional data base of mercury trade and e-waste. + Coordinating the tracking of mercury production and trade data in participating countries. +Improved technical capacity of key stakeholders to address the issues through training and awareness raising (e.g. customs and border control staff trained). | | |
| Knowledge Management and Communication | TA | <i>Outcome:</i> Establishment of a knowledge exchange platform to promote efficiency, learning, innovation to support program stakeholders <i>Indicative targets:</i> + Knowledge repository on harmful chemicals and waste in the Africa region (e.g. mercury, e-waste etc) through active curation of knowledge generated in child projects. + Number of knowledge exchanges successfully implemented. +Cutting-edge knowledge products generated and disseminated amongst stakeholders. | 1,846,330 | 2,000,000 |
| Program Coordination | TA | <i>Outcome:</i> Enhanced coordination and cooperation among program stakeholders | 1,000,000 | 1,000,000 |

| Project Objective: To coordinate participating country investments and promoting learning & knowledge exchange. | | | | |
|--|------------------------------|--|-----------------------|------------------|
| Project Components | Financing Type ⁴⁸ | Project Outcomes | (in \$) | |
| | | | GEF Project Financing | Co-financing |
| | | and other partners, including donors <i>Indicative targets:</i> +Establishment and functioning of a Program Steering Committee. +Program monitoring system successfully developed and implemented. + Annual portfolio reviews. | | |
| Subtotal | | | 4,096,330 | 4,000,000 |
| Project Management Cost (PMC) ⁴⁹ GEFTF | | | 215,597 | 1,000,000 |
| Total Project Cost | | | 4,311,927 | 5,000,000 |

For multi-trust fund projects, provide the total amount of PMC in Table B, and indicate the split of PMC among the different trust

C. CO-FINANCING FOR THE PROJECT BY SOURCE, BY TYPE AND BY NAME

| Sources of Co-financing | Name of Co-financier | Type of Co-financing | Amount (\$) |
|---------------------------|-------------------------------------|----------------------|------------------|
| WB | WB Development Grant Facility (DGF) | Grant | 5,000,000 |
| Total Co-financing | | | 5,000,000 |

D. TRUST FUND RESOURCES REQUESTED BY AGENCY(IES), COUNTRY(IES) AND THE PROGRAMMING OF FUNDS^{a)}

| GEF Agency | Trust Fund | Country/Regional/Global | Focal Area | Program ming of Funds | (in \$) | | |
|----------------------------|------------|-------------------------|----------------------|-----------------------|---------------------------|------------------------------|------------------|
| | | | | | GEF Project Financing (a) | Agency Fee (b) ^{b)} | Total (c)=a+b |
| WBG | GEF TF | Regional | Chemicals and Wastes | POPs | 2,293,578 | 206,422 | 2,500,000 |
| WBG | GEF TF | Regional | Chemicals and V | Mercury | 2,018,349 | 181651 | 2,200,000 |
| Total GEF Resources | | | | | 4,311,927 | 388,073 | 4,700,000 |

⁴⁹ For GEF Project Financing up to \$2 million, PMC could be up to 10% of the subtotal; above \$2 million, PMC could be up to 5% of the subtotal. PMC should be charged proportionately to focal areas based on focal area project financing amount in Table D below.

- a) No need to fill this table if it is a single Agency, single Trust Fund, single focal area and single country project.
- b) Refer to the [Fee Policy for GEF Partner Agencies](#).
- c) If Multi-Trust Fund project :PMC in this table should be the total amount; enter trust fund PMC breakdown here ()

PART II: PROJECT JUSTIFICATION

PROJECT OVERVIEW

A.1. Project Description. Briefly describe: 1) the global environmental and/or adaptation problems, root causes and barriers that need to be addressed; 2) the baseline scenario or any associated baseline projects, 3) the proposed alternative scenario, with a brief description of expected outcomes and components of the project, 4) incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing; 5) global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF); and 6) innovation, sustainability and potential for scaling up.

Problems, Root Cause and Barriers

1. An integrated approach is needed to identify the priority chemical pollution issues present at both country and regional levels considering the varying flow and dispersion characteristics of chemicals and the transboundary trade of hazardous chemicals, such as mercury and e-waste, source of POPs releases. Therefore, interventions dealing with environmental health implications from such mobile pollution pathways are likely to have a larger impact if viewed through a regional lens. For example, a regional approach will allow for a more inclusive and comprehensive mechanism to address cross-border issues related to trade, thus increasing the sustainability of the program objectives. In the case of mercury trade, it is estimated that 90 to 95% of mercury used in many African nations is obtained illegally and/or smuggled from neighbouring nations. ASGM is the largest mercury user and demand sector in the region and globally, however there is limited data and knowledge about the amount of mercury used or the severity and extent of mercury contamination and its health, environmental, and social impacts. With the exception of a few countries like Ghana, there are no policies in place to manage or control the use and/or importation of mercury. There is a need to harmonize the efforts and understand the institutional capacity constraints at national and regional levels and their economic, environmental and social implications so that sound management of chemicals and waste is fully integrated into budget and sector level plans.

Mercury

2. The two major factors that impact national efforts at improving environmental health related to mercury and e-waste for Africa region are – a) the illegal trade in mercury and e-waste, and b) institutional capacity as well as coordination among relevant stakeholders to reduce environmental impacts. Unprecedented impacts on human health and environment due to ASGM and import and open burning of e-waste is now a critical reality in several African countries, jeopardizing not only the economic, social and environmental wellbeing of people but also severely impacting the ability of client governments and regulatory institutions to address their commitments made under the Stockholm and Minamata conventions, and other relevant MEAs such as Basel. The problem of illegal trade (in mercury and e-waste) is particularly acute in Africa, where environmental monitoring and regulatory enforcement is relatively weak.

3. The World Bank launched a regional study to analyse the trade in mercury in the ASGM sector. In order to meet relevant stakeholders in the participating countries and collect preliminary information on mercury trade and mercury use in ASGM in the eight countries, in-country missions were conducted in seven of the countries: Senegal, Burkina Faso, Côte d'Ivoire, Ghana, Tanzania, Uganda, and Zimbabwe. The information collection targeted stakeholders with an understanding of mercury supply chains including government officials (e.g. government chemist, mining and environmental officials), gold miners associations, large-scale mining federations, gold buyers, academics, NGO representatives, and relevant representatives of other private sectors in which mercury play a part. The total estimated consumption of mercury for ASGM in Sub-Saharan Africa in 2010 is in the Global Mercury Assessment 2013 estimated at a total of 334 t/year (if min. and max. figures are simply added, the range is 122-478 t/year). This illegal trade in mercury is facilitated by borders and routes that are not guarded and over which custom/border control authorities have no incentives, will or tools to monitor.

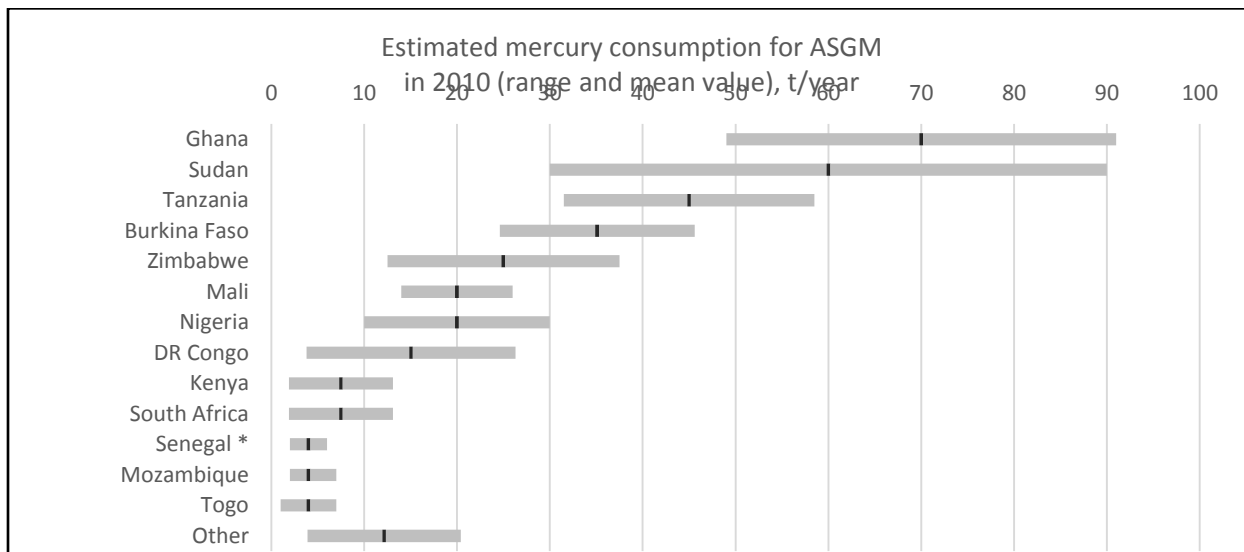


Figure - Estimated mercury consumption for ASGM in 2010, range and mean value (UNEP, 2013a). *Data for Senegal are 2015 updates (Persaud 2015).

4. The trend in total reported tonnages is shown in the figure below. The total recorded net-import (import minus export) ranged from 108 tonnes in 2010 to 283 tonnes in 2013 and is of the same order of magnitude as the total estimated consumption of mercury for ASGM. The trend is increasing, which is well in accordance with an increasing trend in the production of gold from ASGM in many countries in the region. Sudan and Ethiopia are shown together as these countries represent the major part and the import is reported for Sudan for 2010-2012 and for Ethiopia for 2013-2014, indicating that it might be the same trade flow of mercury which has been reported differently (e.g. a trade flow from the port in Djibouti through Ethiopia to Sudan/South Sudan).

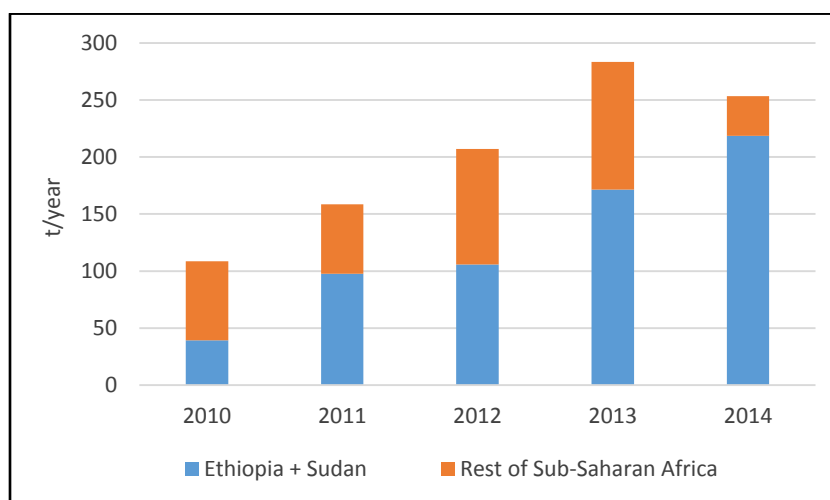
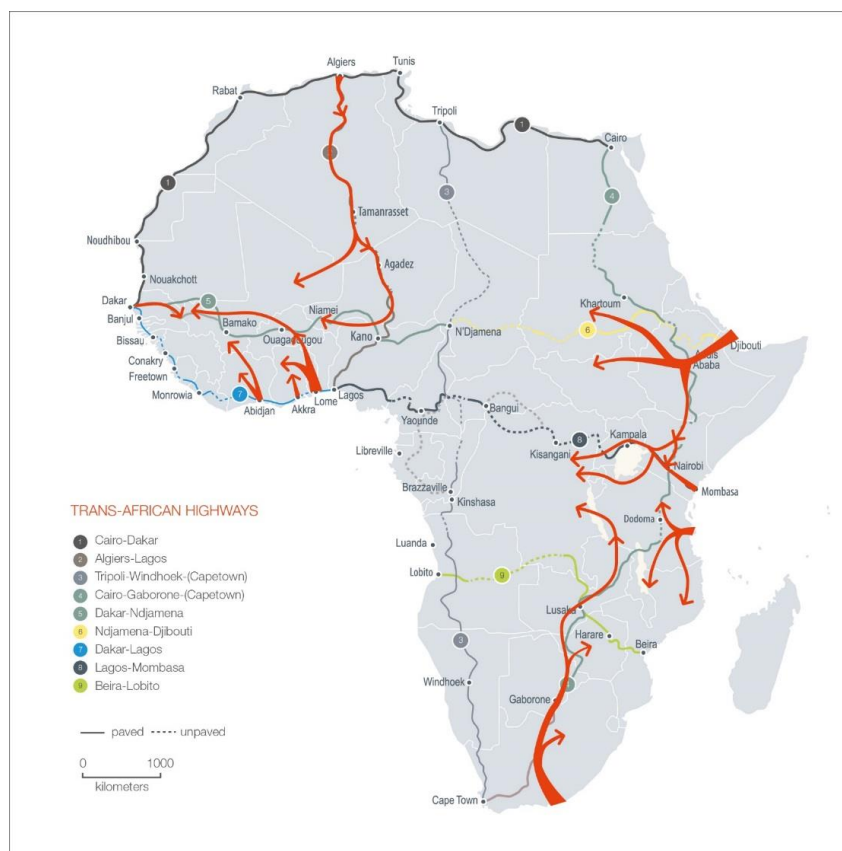


Figure - Total recorded net-import to Sub-Saharan Africa of liquid mercury (28 05 40) during 2010-2014

- The collected information confirms that the sector is characterized by informal and often illegal trade of mercury. Even though the use of mercury for ASGM in many the countries is not banned, some restrictions on the use of mercury for ASGM and on the shipment/trade makes mercury a "suspicious" commodity. The official statistics provide very limited information about the trade between the countries in Sub-Saharan Africa and an initial first estimate of the current mercury supply sources in Sub-Saharan Africa indicate that import represent close to 100% of the supply of liquid mercury which may be used for ASGM in the region. It is still unclear if any production of mercury as by-product takes place in Sub-Saharan Africa. The recorded import is today primarily from Asia, but some information indicates that some mercury is also imported from countries in northern Africa; and in some instance it has been confirmed that some mercury imported from Algeria where the origin of the mercury was a chlor-alkali plant. The Table below presents an initial best estimates of mercury supply sources in Sub-Saharan Africa, which will be updated during the program.

| Source | Estimated supply in 2014 (t/year) | Remark |
|--|-----------------------------------|---|
| Primary mining | ~0 | Mercury was mined in South Africa during 1941-1946 (probably because the limited access to mercury from continental Europe) but since then no primary mercury production in Sub-Saharan Africa has been reported. |
| Import from countries outside the region | 200-400 | Estimated on the basis of the expected consumption of mercury for ASGM (187-467 t/year), the reported import of liquid mercury in 2014 of 254 tonnes and possible import of mercury under other commodity codes |
| Mercury from decommissioned chlor-alkali plants and other chemical plant | ~0 | The total mercury accumulated in the cells of the only chlor-alkali plant in the region is estimated at approximately 21 tonnes. Mercury in wastes, which potentially may be recycled is estimated at approximately 1 t/year. |

| Source | Estimated supply in 2014 (t/year) | Remark |
|--|-----------------------------------|--|
| Recycling of mercury from mercury added products | 1-3 | Assumed to be 3-15% of mercury in products placed on the market. The amount may increase with incentives due to mercury supply shortages. If 50% of all mercury in mercury-added products was recycled, the quantity could increase to 14-19 t/y. |
| By-product mercury from processing of other metals | 0 | No information on production of by-product mercury from processing of other metals are available, but likely by-product mercury is not produced in the region in any significant quantity. See description in main text |
| By-product mercury from gas processing | 0 | UNEP (2006) suggest based on data on mercury impurity of natural gas in South Africa that the concentrations in wellhead gas is at a level where likely the gas has to be cleaned (whereby by-product mercury potentially may be produced). No information on production of by-product mercury from processing of other metals are available, but likely by-product mercury is not produced from natural gas in the region in any significant quantity. [new data for South Africa to be collected] |
| Total (round) | 200-400 | |



6. Preliminary analyses indicate that mercury trade routes in Africa region are complex and the mercury seems typically to be transported across the borders in the region in smaller quantities of one or a few flasks at a time. The figure above shows the transboundary nature of illegal flows of mercury across the continent of Africa.

Ewaste:

7. In SSSA, from 2004 to 2012 (considering internet use as a proxy), the number of internet users (per 100 people) in SSA increased from 1.6 million to 15.3 million in the eight-year period.⁵⁰ The growth in internet access and ICT has been coupled with economic growth and it is clear why – quicker access to information, financial flows, etc. enhance not only business, but governance and access to services, as well. The market trends for ICT in SSA are further fed by investments in the public sector and a range of bilateral and multilateral support for development through investment in ICT in an ever-broadening and diverse range of sectors from health and education to good governance and sound urban development. In 2012, for example, the World Bank introduced a new ICT strategy “aimed at helping developing countries use ICT to transform delivery of basic services, drive innovations and productivity gains, and improve competitiveness. The strategy reflects rapid changes in the ICT sector over the last decade, including a dramatic increase in use of mobile phones and the Internet, falling prices of computing and mobile internet devices, and the increasing prevalence of social media.” The International Finance Corporation alone has made over US\$2.3 billion in telecommunication infrastructure investments in the past 10-15 years.
8. A recent study commission by the World Bank indicate that Ghana, Kenya and Nigeria have the highest levels of e-waste in the region due to their steadily growing involvement in the ICT importing, recycling and refurbishing sectors. The growth of ICT inevitably leads to the growth in e-waste and given that “50 – 80 % of the global e-waste flow is handled by informal sectors in developing countries, where the recycling process itself generates environmental and human health impacts,”⁵¹ it makes sense to begin now to work towards a Green ICT approach. The study to gain further insight into a range of specific issues facing countries with regard to e-waste, indicate that each country faced unique challenges with regard to e-waste. However, there are several knowledge, capacity, institutional and technological root causes that require a regional response. These include:
 - Lack of existing data on e-waste, including the extent of open burning on urban waste disposal sites;
 - Illegal import of e-waste under the category of second-hand goods;
 - Flouting of Basel Convention regulations by ‘importers;’
 - Difficulty tracking the flow of products over borders in personal luggage or other smuggling operations;
 - Unclear or poor labeling standards in export countries;
 - Under-funded and under-trained Customs;
 - Weak or non-existent legislation, regulation and policies;
 - Lack of financial resources to enforce authority where it exists;

⁵⁰ WDI (2014).

⁵¹ Rochat, David. (2014)

9. To effectively address the environmental health risks associated with mercury and e-waste, several critical barriers need to be addressed in a holistic and coordinated way, described below:
- Insufficient coordination, knowledge, and capacity – Stakeholders across the mercury and e-waste chain lack effective coordination mechanisms, knowledge, and technical capacity to comprehensively address the harmful implications
 - Disenfranchisement of local communities – Mining communities who live around ASG mines and urban communities around sites where open burning take place are often not provided with opportunities and incentives to directly and indirectly engage, manage, and benefit from better management of these wastes and chemicals.
 - Lack of Enforcement - Enforcement professionals are poorly resourced, inadequately trained, and there is poor monitoring and evidence of environmental impacts.
 - High corruption levels - Many low-paid custom/border patrol agencies as well as environmental enforcement agency receive bribes to conceal trade and indiscriminate disposal/discharge into natural environment.
 - Weak legal systems - Many countries in Africa region still do not consider mercury trade and e-waste burning as serious health issue
 - Ad hoc urban planning in view of competing demands for land by traders creates conflict among different users, leading to negative consequences on both livelihoods and environmental health.
 - Lack of awareness and unsustainable demand - Current national and regional efforts to raise awareness and reduce environmental health risks due to mercury and e-waste are inadequate and insufficient to change consumer behavior

Baseline scenario: regional context

10. Past experiences have shown that isolated policy and regulatory reform interventions in one country may not necessarily produce significant results, but rather run the risk of shifting the problem toward other countries where regulations and enforcement are weak. Emerging recommendations from the studies and assessments conducted during the preparation of this program support a need to harmonize efforts and to understand the institutional capacity constraints and their economic, environmental and social implications both at the national and regional levels.
11. Regional Economic Communities (RECs) in Africa [Economic Community of West African States (ECOWAS), Common Market for Eastern and Southern Africa (COMESA), Southern African Development Community (SADC)] can be used as a platform to promote the adoption of policies and disseminate lessons learned and good practices in a very efficient way based on a mandate of policy and regulation harmonization, considering the varying flow and dispersion characteristics of chemicals and the transboundary trade of hazardous chemicals, such as mercury and e-waste.
12. There exist a number of important multilateral environment conventions that provide avenues to engage and coordinate environmental health issues at a regional level. The Minamata Convention on Mercury provides a framework through which a toxic compound of global concern can be used and managed to drive national policy reforms to protect human health and the environment. The Stockholm Convention is a global treaty to protect human health and the environment from persistent organic pollutants (POPs). The Strategic Approach to International Chemicals Management (SAICM) is a policy framework to foster the sound

management of chemicals. Meanwhile, 52 African countries have adopted the Libreville Declaration on health and Environment in Africa to enhance inter-sectoral actions and integrate human health and environment co-benefits into national and regional development policies, strategies and plans. Most African countries are signatories to various other Environmental multilateral conventions, including Basel Convention (on the control of transboundary movements of hazardous wastes) and the Rotterdam Convention for promoting shared responsibility and cooperation among Parties in the international trade of hazardous chemicals. See also section A4 on coordination with other existing projects in the baseline.

Proposed alternative scenario

13. The WBG will lead the proposed coordination project to enhance the individual results achieved by the national projects, enhance coordination among stakeholders, monitor outcomes of national projects, support preparation of projects, capture of lessons learned and application of best practices, development of both a program communication strategy & a knowledge management platform, and strengthen key institutions involved in the chemicals and waste management sector. GEF financing will enable making advances in understanding and addressing the institutional and technical complexities of environmental health and pollution management issues related to waste and chemicals. The project will also support the policy makers in the region to understand and address the reality of toxic pollution and develop regional partnerships and enhance transboundary collaboration.

14. The Project Development Objective (PDO) is to coordinate participating country investments and promoting learning & knowledge exchange.

Key outcome indicators/performance indicators for the project are:

- Regional coordination amongst countries and partners through Regional Economic Communities to enhance institutional capacity efforts
- Establishment of a knowledge exchange platform to promote efficiency, learning, innovation and communication to support program stakeholders
- Enhanced coordination and cooperation among program stakeholders

15. The proposed components are as below:

Component 1: Strengthening regional partnerships and policy dialogue

16. This component will improve the capabilities of key partnerships or institutions to provide a leadership platform to enhance the effectiveness of organizations working across the harmful chemicals and waste management sector in the region. This will include supporting regional partnerships that the national projects can leverage. A regional platform will be established based on existing structures and institutions to coordinate regional efforts and promote the dissemination of results through a variety of effective communication methods and products. The design would be further elaborated during preparation based on discussions with stakeholders.

17. The regional platform will support working through existing regional forums such as ECOWAS/ COMESA/ SADC to enhance capacity of targeted countries and enable discussion

and agreement on common aspects of regional sectoral policies and strategies and regulation related to transboundary impacts. Such a platform will focus on increasing capacities to generate, access and use information and knowledge; increasing capacities to research, acquire, communicate, educate and make use of pertinent information, to be able to diagnose and understand chemicals management challenges and identify potential solutions at the regional level. Potential considerations include development or enhancement of diagnostic tools, and targeted trainings.

18. The WBG will collaborate with various development partners during the project implementation, and identify key institutions to support that can deliver both national and local level benefits. In selecting additional partners to support, the WBG will use the following criteria: (i) impact to national projects; (ii) ability to leverage co-financing, including private sector funding; and (iii) capacity to introduce state of the art knowledge, expertise, and technologies to maximize benefit of solutions deployed to Program sites. Strategic advisory groups and task forces as relevant will be established as relevant for focused discussions on the thematic and sub-thematic sectors considered under the Program.

Component 2: Knowledge management and communication

19. An essential Program component is knowledge management (KM) to scale up best practices, leverage lessons learned from south-south cooperation between countries and field tours in participating countries, and drive innovation. This component aims to facilitate these knowledge exchanges and capture of lessons learned amongst program participants and others, to build technical capacities and enhance the impact of project interventions. Activities will include organization of a number of focused workshops and meetings to bring together executing agencies, child project leaders to exchange knowledge, learning, and engage in an idea exchange forum. This will include making available specialized any knowledge, tools, and techniques to help Program stakeholders prepare and deliver on their targets. Annual meetings will serve as an important mechanism for child project leaders to network, present project results, obtain input from peers and get inspired by hearing from leading practitioners and visionaries.
20. During project preparation, a repository, or online platform, will be identified to store/disseminate knowledge products and facilitate collaboration. These products may include documents specific to the Program and/or national projects, outputs of meetings and learning events, and knowledge resources developed by various partners that contribute to the overall agenda and program knowledge base. Specifically, various activities will be conducted to disseminate existing lessons learned and capture lessons learned from child project activities. A portfolio approach to capturing and disseminating will facilitate identification of best practices, important lessons, and innovative solutions to scale the most effective solutions across the Program.
21. The project will provide guidance for Program communications to a diverse audience including partners and stakeholders. Sample communications products may include, brochures, website briefs, presentations, and publications; and a social media to include blogs and discussion forums. Through its program level monitoring, the project will collate national project reports, data, and analytical information to include in communications strategies. The project will also leverage no cost/low cost survey tools (i.e. survey monkey) or various forums to communicate with and obtain feedback from program stakeholders

Component 3: Program Coordination

22. This component will coordinate and maintain extensive and continued stakeholder consultations at the national and regional levels to support all components of the project. A Program Steering Committee (PSC) with representation from key partners and stakeholders will be established as an advisory mechanism to maximize synergies and support the successful design and implementation of the overall Program. The main role of the PSC is to provide a coordination forum, a monitoring platform and provide an overall, high-level, coordination of the technical alignment and synergy between the Program's components to allow cross-fertilization.
23. An important component of the Program is the monitoring and evaluation framework. The WBG will lead the design, development, and deployment of a robust M&E framework for the Program to measure the impact of the Program and progress against various performance measures. The Program level M&E framework will be built with information provided by the national projects. The WBG will consolidate project-level information to aggregate results at the Program level. Information on indicator sources and methodologies to document tools and resources for child projects to use and report will be collated. In addition, to the extent required, the WBG will work with the GEF and other stakeholders to create/tailor reporting templates, tools, and processes to facilitate the national project reporting.
24. The national projects will determine and implement the baseline, beneficiary assessments, and impact evaluation studies will be determined

Incremental Reasoning and Global environmental benefits

25. The GEF resources are leveraging substantial co-financing through IDA (about US\$243 million) related to the proposed child project investments. This project will provide incremental funding across the suite of project interventions to reduce the risks of exposure to harmful and toxic chemicals, such as mercury, POPs containing e-waste and POPs.
26. This Project focuses on leveraging economies of scale and delivering results more quickly through coordination and knowledge management. New integrated approaches, methodologies, and technologies can enhance targeted site interventions and data driven decision-making. Doing this will have immediate and longer term socio-economic benefits for all relevant stakeholders in the context of environmental health risks associated with harmful chemicals and waste management. This directly benefits local people often the vulnerable poor and women.

A.2. Stakeholders. Will project design include the participation of relevant stakeholders from civil society and indigenous people? (yes /no) If yes, identify key stakeholders and briefly describe how they will be engaged in project design/preparation:

27. The project will build on far reaching network of stakeholders at the local, national and regional levels. At the local level, mining communities are the key, while at the national level, the ministry of Mines and Environment will be important to the success and sustainability of the

program, as described above. As a result the program will provide a platform to magnify its interventions across all branches of the Government including the executive, the legislative, the judiciary and the Ministry of Finance. Working with Customs and Border control agencies will be critical. Given the role of private sector miners, their engagement will be critical to the success of the program. So too is raising awareness about cleaner technologies that could be tested by artisanal miners without loss of revenue or health. The program will provide a useful platform to feed innovation and policy developed across the region, and to transfer knowledge to child projects. In particular the program will work closely with various NGOs and UN agencies who have been promoting demonstration of good practices at community level.

28. Collaboration among environmental regulators and urban municipal councils with jurisdiction over the contaminated land is critical. The investment, institution and information ideas proposed under the program to tackle the environmental health issues have been discussed in a significant high level round table with various interested countries, namely, the Governments of Ghana, Tanzania, Zambia, Kenya, and Senegal and with the USEPA, NRDC, UNDP, UNIDO, UNEP, industry associations, and Non-Governmental Organizations. The EHPMP will also work closely with community-based organizations and local communities, who are invested in and benefit from current practices in ASGM sector or from open burning of electronic waste, including opportunities for income generation and green job opportunities. This engagement will go beyond consultation to actively involve communities in the design and implementation of child projects and in the learning across the Program. Special attention will be given to ensure the participation of indigenous people at the site level.

A.3 Risk. Indicate risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the project design (table format acceptable):

| Category | Rating and Risk Management |
|---|--|
| Institutional Commitment for Implementation and Sustainability | Moderate |
| Insufficient commitment to mainstream chemical and waste issues management issues by governments. | Increased awareness to sustainably allocate budget and retained capacity has already created to address chemical and waste issues during the child project selection process and through the development and promotion of successful models of sustainable funding and adequate staffing from other initiatives. |
| Environmental and Social | Low |
| Risks related to health and safety issues when demonstration strategies are implemented. | The project will provide personnel protection equipment and training to the operators of the facilities and all those who are exposed to chemicals during demonstration activities in contaminated areas. |
| Stakeholder Information Sharing | Low |
| Governmental agencies / private companies unwilling to share information / data | Information and knowledge generation, management and dissemination are a key component of this project. Open-access and |

| | |
|--|--|
| | the mutual benefits of information sharing will be included in all agreements for databases, websites, etc. sponsored by the project. |
| Stakeholders Harmonization | Moderate |
| Weak coordination and harmonization of the project with other capacity building activities that will be undertaken by other ongoing or potential projects. | All projects are designed to ensure regular communications and timely information exchange among project owners, implementers and stakeholders. Furthermore, the consultation mechanism initiated by the project among international and national stakeholders will avoid overlapping capacity building activities among and between the on-going and potential projects |
| Overall | Moderate |

29. **The overall rating is Moderate.** The complexity of the problem and coordinating key partners and at the same time delivering effective results in a timely manner is not straightforward. Lowering this risk will require that this program defines very clear and concrete indicators that can be monitored easily. During preparation, the monitoring tools and timeliness of the reports will be fully designed with engagement from all partners. The project's success will depend on the level of leadership that the Bank can show and the incorporation of the opinion of experts as well as the political commitment by national governments.

A.4. Coordination. Outline the coordination with other relevant GEF-financed and other initiatives:

30. The efforts envisaged under this regional project are complementary and designed to build upon previous work and existing relevant activities while creating the conditions for mainstreaming of the chemicals agenda within development priorities and scaling up. Existing initiatives include several agencies such as UNEP (Regional integrated health and environment observatory in Kenya, Senegal, Tanzania and Zambia); UNIDO (regional reduction of uPOPs from open burning in Tanzania and Zambia); UNDP (Ghana PCB Management); UNEP (Regional PCB management in Southern Africa); UNIDO (Senegal improved waste management for dioxin reduction); UNDP (demonstration of mercury reduction from medical waste); FAO (regional disposal of obsolete pesticides); UNEP (regional PCB management project); UNEP (regional DDT alternatives and promotion of IVM); UNIDO (Kenya dioxin reduction from improved wastes management). This project will also draw synergies with and complement other national initiatives in urban and mining sectors, including projects funded through the World Bank, USEPA, GEF and other agencies and NGOs, thereby expanding opportunities for exchange of lessons learned and good practice across the region. This includes building on the initial efforts under the GMP (Global Mercury Project) initiated by UNIDO which worked to demonstrate ways of overcoming barriers to the adoption of best practices, waste minimization strategies and pollution prevention measures.

B.1 Is the project consistent with the National strategies and plans or reports and assessments under relevant conventions? For biodiversity related projects, please reference the Aichi Targets

that the project will contribute to achieving. (yes /no). If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, etc.:

31. The project is consistent with the requirements under the Stockholm and the Minamata Conventions. With regards to the Minamata Convention, the program supports Article 7 where signatory countries are required to develop and implement a national action plan NAP outlining national objectives and reduction targets, and actions to eliminate whole ore amalgamation, open burning of amalgam, as well as all burning of amalgam in residential areas where many such activities take place in processing Countries will be supported to meet their obligations under the Minamata Convention countries and will allow for promoting knowledge about risks associated with mercury, best environmental practices, and alternative cleaner technologies that are environmentally, technically, socially and economically viable.
32. The project will also support the obligations under the Stockholm Convention which requires signatories to reduce the risks to human health and the environment arising from the release of Persistent Organic Pollutants. By strengthening the institutional and legislative arrangements and demonstrating application of technological tools and economic approaches in addressing environmental health concerns associated with urban dumpsites and electronic waste recycling sites which are significant emitters of POPs, this program will support countries in meeting this obligation.

ANNEX B: Technical Annex with Additional Background Information

Context:

Hazardous and Toxic Waste Management is a big challenge for sustainable growth. The management of hazardous waste and toxic pollutants is an emerging challenge for most countries in Africa, and is resulting in serious environmental and public health hazard in rural and urban areas that needs to be addressed in an institutionally and regionally collaborative manner. These concerns in the Africa region have very strong linkages to people's livelihood and the health of workers and the surrounding environment. Economic growth and environmental degradation are often closely linked and with improved economic growth, many African countries are witnessing an increasing trend in use of potentially hazardous chemicals, such as agrochemicals, mercury in mining, and generation of wastes, such as electronic waste (e-waste), heavy metals like lead in batteries, persistent organic pollutants (POPs) and polychlorinated biphenyls (PCBs).

Key environmental health concern for most African countries are widely known. Many cities are becoming rapidly urbanized which leads to the generation of huge quantities of municipal, commercial, infectious and industrial waste and leading to the creation of open waste-dump sites. This results in health risks to workers and poor communities living on their fringes. Increasing industrialization is resulting in the increasing trend in use of potentially hazardous chemicals and the generation of waste. The and unregulated open burning of waste is impacting both urban air quality and the surrounding environment. Unregulated and informal use of mercury in artisanal and small scale gold mining (ASGM) is creating a legacy of severe adverse (and irreversible) environmental health, economic, and social impacts. Informal, extralegal, or illegal nature of ASGM operations makes it a source of social problems, including child labor and other labor issues; land tenure issues; migration and other social instability and potential conflict. Electronic waste contains toxic substances such as lead, mercury, cadmium, arsenic. Informal recycling methods, primarily open-air burning, results in serious health and environmental impacts due to indiscriminate contamination of land, water and air.

Environmental health problems are often associated with livelihood challenges and unawareness of long term impacts to health and the surrounding environment. These are complex social and economic, as well as environmental, challenges. This usually arise from inefficient use of materials and resources, where possible solutions are based on finding and sharing cleaner and more productive ways of working. Volatile Organic Compounds and mercury emissions alone account for 5.7 to 13 percent of the annual US\$ 2 trillion to 4.5 trillion (or USD 2000 billion - 4500 billion) in ecosystems and biodiversity losses, while estimates for selected chemicals (including pesticides) involved in unintentional acute and occupational poisonings, a limited number of occupational carcinogens and particulates and lead, in 2004, resulted in a total of 964,000 deaths and 20,986,153 DALYs, corresponding to 1.6% of the total deaths and 1.4% of the total burden of disease world wide⁵². As per recent estimates, over 200 million people are exposed to toxins at dangerous levels in the developing world. Wealthy countries have shifted manufacturing and mining to poorer countries with inadequate pollution controls, whereas the local populations bear the burden of exposures, which causes death and disability; reduced life expectancy, reduced IQ, genetic damage, cancer, increased susceptibility to infection.

⁵² Cost of Inaction on the Sound Management of Chemicals: UNEP 2013

As per recent estimates⁵³, more than 200 million people exposed to toxins at dangerous levels in the developing world. Wealthy countries have shifted manufacturing and mining to poorer countries with inadequate pollution controls, while the local populations have borne the health burden of environmental contamination. Many sites belonging to smaller local chemical companies, abandoned sites, or artisanal sites continue to remain the main source of exposure to environmental contamination in several countries. These contamination caused by multiple contaminants such as mercury, lead, persistent organic pollutants, electronic waste etc. have reportedly caused death and disability; reduced life expectancy; reduced IQ; genetic damage; cancer; increased susceptibility to infection. Children are especially vulnerable to the health risks as their intake of air, water and food in proportion to their weight is significantly increased compared to adults, - and with that, the risk of hazardous chemical absorption. Furthermore, their bodies' functional systems such as the central nervous, immune, reproductive and digestive system are still developing and exposure to toxic substances, by hampering further development, may cause irreversible damage⁵⁴.

Problems due to environmental contamination is often associated with people struggling to make a living and unaware of long term health impacts, usually arising from inefficient use of materials and resources, in industry, agriculture and mining. Experts believe that long term solutions should be based on building partnership across institutions and stakeholders; finding and sharing cleaner and simpler ways of addressing environmental health impacts on community using an area-based approach; and adopting an integrated approach to environmental health issue that tends to complex with strong lineage to social and economic wellbeing.

The program is focused on key environmental health pollutants, including mercury and POPs, with specific objective to: discuss current country statuses and challenges related to toxic pollutants (such as from artisanal gold mining, electronic waste and solid waste); and identify areas of cooperation and collaboration for the region to meet their obligations under the various Environmental multilateral conventions.

Mercury Use in Artisanal Gold Mining

Africa hosts a third of the world's mineral wealth, including significant deposits of globally known reserves of gold. The mining sector is amongst the fastest growing sectors in several African nations, such as Tanzania, Ghana and Zimbabwe, Mali, Senegal, Burkina Faso and Uganda. In Tanzania, the third largest producer of gold in Africa, revenue from gold exports increased over 35 % from 2011 to 2012. The mineral sector remains critical to in most African countries development, and has been an important contributor to the national economy despite fall in metal prices like gold experienced during the year 2013. However, mining of gold in most African countries is generally characterized by few large scale mechanized operations, hundreds of medium sized operations and tens of thousands of small scale operations carried out by millions of local entrepreneurs, panners or artisans, who use mercury (a known neurotoxic chemical) as an essential input to extract gold. **Exposure to mercury damages the brain, central nervous system, and kidneys, and is particularly dangerous to babies and children as it retards brain development, causing irreversible damage and stunting growth in young children and unborn babies through poisoning of food chain.** Unplanned and unregulated artisanal and small scale gold mining (ASGM) in countries like Tanzania has generally left a legacy of severe adverse

⁵³ Blacksmith Institute 2013

⁵⁴ WHO: Children's Environmental Health: E-waste

(and irreversible) environmental health, economic, and social impacts, often affecting disproportionately the poorest and most vulnerable communities.

According to UNEP, an estimated 3.5 million people are at risk of health impacts in the artisanal and small scale gold mining (ASGM) sector of which 2.5million are in Africa. Also as per 2013 report by Human rights Watch (HRW) approximately 30-50% of labor force working in the ASGM sector is children. According to the ASGM council, the gold mining sector employs estimated 10-12 million people worldwide, and indirectly supports more than 100 million people. It also estimates that ASGM accounts for approximately 15% of the world's gold production or about 400 tons per annum, thereby injecting roughly US\$17 billion directly into rural communities annually. Many ASGM activities are carried out near or upstream of streams and rivers that drain into or are in close proximity to major freshwater impoundments such as lakes and manmade reservoirs created by storage dams for water supply, irrigation and hydropower. These impoundments act as sinks for mercury that accumulates in sediments and bio-accumulates in fish and tissues of other aquatic species. In Tanzania, for example, ASGM is carried out near major freshwater lakes such as Victoria, Nyasa, Rukwa and Tanganyika which produce thriving fisheries for export and local consumption. By virtue of being close to ASGM areas, these freshwater bodies face real and growing risks of contamination if a government plan for managing mercury is not prepared and implemented in the near future.

Some of the key consequences of mercury usage in ASGM are highlighted below.

- Mercury is a dangerous neurotoxic with significant health and economic consequences, which has broader multi-sectoral risks beyond direct health risks to miners and their families. Mercury contamination poses potentially serious economic consequences to the lucrative local and regional fisheries with potentially grave economic consequences due to its bio-accumulation in organic tissues and along the food chain. Many ASGM activities are carried out near or upstream of streams and rivers that drain into or are in close proximity to major freshwater impoundments such as lakes and manmade reservoirs created by storage dams for water supply, irrigation and hydropower. In Tanzania, for example, ASGM is carried out near major freshwater lakes such as Victoria, Nyasa, Rukwa and Tanganyika which host thriving fisheries for export and local consumption.
- Mercury used in ASGM in Africa is mostly obtained illegally, posing a serious governance challenge. It is estimated that 90 to 95 percent of mercury used in many African nations is obtained illegally and/or smuggled from neighboring nations despite border controls which constitute a serious failure of the government's obligation to protect the environmental health of the population. Yet, there is no systematic monitoring of mercury in place. Current data and knowledge about the amount of mercury used or the severity and extent of mercury contamination and its health, environmental, and social impacts is limited, patchy or dated. There are no policies in place to regulate or manage the use of mercury and no regulations for controlling the importation or use of mercury. There are also no government sanctioned guidelines for safe use of mercury in place that are being used.
- Institutional capacity (both technical and administrative) to monitor use of mercury as well as its health and environmental consequences is limited in most African nations. There is therefore, an urgent need to understand the capacity constraints, linked with economic, environment and social implications of widespread use of chemicals, such as mercury.

- There is little information on trade diagnostics of mercury in Sub-Saharan Africa including data on quantities, flows, and policies for understanding and decreasing the supply and demand of mercury.

In Tanzania, mercury is estimated to be affecting over 2 million men, women, and children directly or indirectly. The medium and long term economic impacts of mercury contamination due to increased health and environmental costs are expected to be very high in Africa as proven by Global Mercury Project, however limited scientific assessment have been done so far for countries like Zimbabwe and Tanzania that could be translated into specific national action plan targeting specific hot spots. Mercury contamination poses potentially serious economic consequences to the lucrative local and regional fisheries with potentially grave economic consequences. The aquatic environment is a critical pathway that links mercury to human health in three ways: a) hundreds of tons of mercury is released directly into or runs off in water bodies, however no assessment has been carried out to understand the anthropogenic impacts of mercury residue in runoff or water bodies; b) mercury in the aquatic environment can be transformed into methyl-mercury, which is far more toxic to humans and animals and can enter and bio-magnify in food webs more readily than other forms of mercury; and c) much human exposure to mercury is through the consumption of fish and other marine foods, making aquatic pathways the critical link to human health. Lake Victoria supports the livelihood of nearly 30 million people from Kenya, Uganda, Tanzania, Rwanda, and Burundi and generates lucrative export fisheries worth nearly US \$ 500 million annually. Zimbabwe's 8000 small, medium and large scale dams used for domestic water supply and irrigation are also important reservoirs for fisheries. The Kariba reservoir on the Zambezi River, shared by Zambia and Zimbabwe, and the Akosombo reservoir on the Volta River in Ghana were formed by dams for generating hydroelectricity; they also provide lucrative fisheries for local consumption and export. There is evidence that ASGM contamination is no longer localized. It is therefore only a matter of time for mercury contamination from ASGM to reach many lakes and reservoirs and contaminate the fish, if this is not already the case. Mercury contamination poses a serious risk to the lucrative local and export fisheries, including from the Great Lakes of Africa (Victoria, Tanganyika and Nyasa) as well as major reservoirs such as Kariba and Akasombo.

Mercury used in ASGM is mostly obtained illegally, posing a serious governance challenge. It is estimated that 90 to 95 percent of mercury used in many African nations is obtained illegally and/or smuggled from neighbouring nations, representing a failure of governance. In 2011, it was estimated that 45 tons of mercury were used in Tanzania for ASGM by around 500,000 small-scale gold miners, including small children, mostly obtained illegally from neighbouring nations to extract gold with minimal protection. Whereas, the total amount of mercury imported officially in Tanzania was less than 2 tones. While there is need to plan and capacitate regular monitoring of mercury used in ASGM in most African countries, the trend in gold production and gold prices suggests rapidly increasing demand for and growing and widespread use of mercury, and therefore, by extension increasing contamination. Yet there is no systematic monitoring of mercury in place in most African countries.

Current data and knowledge about the amount of mercury used or the severity and extent of mercury contamination and its health, environmental, and social impacts is limited, patchy or dated. There are no policies in place to regulate or manage the use of mercury. There are no regulations for controlling the importation or use of mercury except in few countries like Ghana. There are no government sanctioned guidelines for safe use of mercury in place that are being used, while many UN agencies have produced guidance manuals. Institutional capacity (both technical and administrative) and incentives to

monitor use of mercury as well as its health and environmental consequences is limited in most African nations. There is therefore an urgent need to understand the institutional capacity constraints as and linkage between the environmental governance in pre-dominantly mineral based countries in Africa and its economic, environment and social implications, such as in small scale gold mining activities, which has a widespread use of chemicals such as mercury with significant environmental health implications.

The environmental health implications of the use and release of mercury need urgent attention before they become unmanageable and irreversible. Experience from Japan, Indonesia, Philippines and Latin America nations has indicated the extremely high social, environmental health and economic costs of serious mercury contamination to communities, which most African nations cannot afford.

The Minamata Convention on mercury adopted on October 11, 2013 aimed to regulate anthropogenic emissions and releases of mercury and its compounds in order to protect human health and the environment. Article 7 of the treaty states that each Party that has artisanal and small-scale gold mining and processing within its territory shall take steps to reduce, and where feasible eliminate, the use of mercury and mercury compounds in, and the emissions and releases to the environment of mercury from, such mining and processing. Approximately 28 African Governments are working towards developing a draft roadmap which will also help them meet the requirements of the Minamata Convention.

Under the baseline scenario, the many governments and international organizations would continue to implement some of these activities in a scattered manner. This could potentially widen the gap between national policy developments and undermine regional cohesion and harmonization as well as widen the gap between national dialogue and regional commitments. Increased attention by many organization to address the needs to address the environmental health implications of mercury use in Artisanal gold mining are not always optimally focused and do not necessarily contribute to knowledge sharing and cross-fertilization, and the achievement of economies of scale through well-coordinated implementation. In addition an opportunity would be lost to bring together and allow for learning among national governments, international and national NGOs, other development agencies (African and International), regulators in gold producing countries, gold miners, mercury producers and traders as well as mining industry in general. **Systematic, well organized government regulation, coupled with introduction of appropriate technology and knowledge for miners, consistently proves the most effective strategy for reducing impacts.** Experts indicate the need to address the continued difficulties of addressing mercury use in ASGM gold communities by: i) raising awareness of mercury's impacts; ii) gauging communities' level of awareness about exposure to mercury's toxicity; and iii) more importantly, investigating how alternatives can be disseminated in light of new mercury treaty. Recent studies have proven that ASGM is the largest component of anthropogenic sources of mercury contamination globally; impacting many sectors.

Electronic Waste in Sub-Saharan Africa

Over the past 10-20 years, the market for information and communications technology (ICT) has grown exponentially to at least US\$2 trillion in 2013. While this growth has brought with it unprecedented socio-economic benefits related to access to technology, information and enhanced communication, the sky-rocketing numbers of devices and their typically, short life, have led to a growing, global environmental problem: electronic waste or, as it is more commonly

known, e-waste. In recent years, with burgeoning markets for new and used technology in developing countries, as well as the growing trend of exporting e-waste for processing and ‘recycling’ overseas, the issue of e-waste has been migrating to developing countries in both Asia and Africa; countries which typically do not have the resources or infrastructure to manage the high volume, of often hazardous, waste. The number of African countries confronting this issue is large and growing.

The e-waste issue is complex. Looked at from one perspective, e-waste can be seen as a valuable commodity with quantities of gold, silver, copper, palladium and other compounds available through processing. From another perspective, e-waste is part of a serious hazardous waste problem confronting African countries, exposing people and the local and global environments to a range of toxic substances, including heavy metals, flame retardants and polychlorinated biphenyls (PCBs). In reality, both these perspectives are true yielding a multi-faceted issue that requires short-, medium- and long-term interventions by public and private stakeholders from across both the formal and informal sectors.

E-waste has serious negative consequences for human and environmental health and it is growing rapidly and exponentially in SSA. The Global Alliance on Health and Pollution currently estimates that over 3 million people are at risk of exposure to toxic chemicals through e-waste. Individuals at particular risk are the children and adults involved in the ‘recycling’ of e-waste where exposure to lead and cadmium from cathode ray tube (CRT) processing or to polycyclic aromatic hydrocarbons (PAHs) and other toxic chemicals from burning plastics and cables is common. Further human and environmental impacts stem from a range of toxic substances contained in e-waste that also persist in the environment and bio-accumulate, such as brominated flame retardants, heavy metals (e.g., lead, nickel, chromium, mercury), and persistent organic pollutants (e.g., dioxins, polychlorinated biphenyls (PCBs)). Employing children in the dismantling and processing of e-waste is of particular concern. The Secretariat of the Basel Convention (SBC) recently reported that in some West African countries children as young as five undertake the dismantling of small parts and sorting of materials while older children participate in collecting, dismantling and processing. Due to their small size and stage of development, children are at higher risk from exposure to toxic chemicals than most adults. Globally humans and the environment are also at risk due to the range of toxic substances contained in e-waste that also persist in the environment and bio-accumulate, such as brominated flame retardants, heavy metals (e.g., lead, nickel, chromium, mercury), and persistent organic pollutants (e.g., dioxins, polychlorinated biphenyls). A recent analysis utilizing UN Comtrade data, for example, shows e-waste in Ghana growing from under 1,000 tons in the late 1990s to close to 14,000 tons of IT-associated waste projected by 2016.

Given the rapid bridging of the digital divide, developed countries will set, although with a time lag, the future trend of ICT products. Electronic components still account for 52 percent of total ICT in developing countries showing that the flourishing business of updating, repairing and refurbishing ICT requires the continued import of Electronic Components. In its report, ‘Where are WEEE in Africa?’ the SBC indicates that e-waste and used electronic equipment (EEE) is being exported to developing countries through a variety of formal and informal channels. Particular elements of this global trade that eventually impact developing countries, include the export of used EEES close to the end of their useful life; the export of erroneously labeled used EEE which is, in fact, inoperable; and the export of e-waste itself for recycling and processing. **This results in what becomes a de facto ‘dump’ of e-waste from developed to developing countries (Fig.2).** At the global level, and based on the EU broader definition of e-waste, the trend

of EEE volume is quasi-mirrored by the volume of e-waste generated that reached 48.9 million tonnes in 2012. Ranked by major estimated e-waste generators, the EU, US, Japan, China and India represents 66 percent of the e-waste generated globally. Other countries, including those in Africa, account for the remaining 34 percent of the total as reported by UNCTAD. There is no system globally of tracking legal or illegal shipment of electronic waste.



Figure: Suspected routes of e-waste

From 2004 to 2012 (considering internet use as a proxy), the number of internet users (per 100 people) in Sub-Saharan Africa increased from 1.6 million to 15.3 million in the eight-year period. The growth in internet access and ICT has been coupled with economic growth and it is clear why – quicker access to information, financial flows, etc. enhance not only business, but governance and access to services, as well. Studies indicate that Ghana, Kenya and Nigeria have the highest levels of e-waste in the region due to their steadily growing involvement in the ICT importing, recycling and refurbishing sectors. E-waste processing in Benin, Kenya, Liberia, Senegal, Tanzania and Uganda can mainly be categorized as small-scale informal e-waste collection and dismantling. In Côte d’Ivoire, Ghana and Nigeria the sector utilizes primarily small scale established e-waste collection, pre-processing and refining. Both groups have potential to continue in a more sustainable pre-processing industry with the right support in terms of capacity building and knowledge exchange.

Most impacted African countries are characterized by lack of existing data on e-waste; illegal import of e-waste under the category of second-hand goods; flouting of Basel Convention regulations by ‘importers;’ difficulty tracking the flow of products over borders in personal luggage or other smuggling operations; unclear or poor labeling standards in export countries; under-funded and under-trained Customs; Weak or non-existent legislation, regulation and policies; Lack of financial resources to enforce authority where it exists; presence of similar toxic compounds in the Electrical and Electronic Equipment (EEE) waste stream, including heavy metals, persistent toxic substances, and brominated flame retardants all

determined to have serious effects on human and environmental health; and some positive initiatives to address e-waste, including pilot recycling projects, take back schemes, Public-Private Partnerships, and e-waste guidance and legislation.

While still limited, a range of existing and new international and national regulatory instruments, policies and public-private initiatives are being drawn upon to begin to address e-waste. **These instruments include existing global and regional environmental conventions such as the Basel Convention on the Transboundary Movement of Hazardous Waste, the Stockholm Convention on Persistent Organic Pollutants and the Bamako Convention, UN programs such as ‘Solving the E-waste Problem (StEP) and programs of various regional organizations, such as the East African Communications Organization.** Other initiatives within particular SSA countries cover a broad range of intervention approaches from e-waste strategies to pilots of take back schemes to large-scale public-private investments in state of the art recycling facilities, such as the Hewlett-Packard-Kenyan initiative. While success has varied in their implementation, these projects, policies and instruments provide a strong base upon which to build an integrated approach to e-waste management and Green ICT.

With respect to e-waste management within Africa region, a regional Task Force on Environment and E-waste was set up for Eastern African countries to effectively deal with the increase of ICT usage and the e-waste generated at the regional level in Eastern Africa where five countries, Burundi, Kenya, Rwanda, Tanzania and Uganda joined forces to create a more coordinated response to the issue of e-waste. Opportunities for cooperation include working towards harmonized policies and guidelines, setting benchmarks and sharing information, creating jobs, and transforming e-waste into a value-added resource. Risks were acknowledged by the five countries in terms of the difficulty in attracting the private sector to engage in e-waste recycling due to the current lack of incentives and profitability. The e-waste management policy model was led by the East African Communications Organization (a regional body that comprises of the national ICT regulators, operators and service providers in the telecoms, postal and broadcasting sub-sectors) which performed similar tasks in the region.

Where do SSA Countries Most Affected by E-waste Stand?

| | Policy & Legislation | Business & Finance | Technology & Skills | Monitoring & Control | Marketing & Awareness |
|------------------------------|---|--------------------|------------------------------|----------------------|---|
| Country Assessment | South Africa, Kenya, Uganda, Tanzania, Nigeria, Benin, Ghana, Côte d'Ivoire, (Liberia), Senegal | | | | |
| National Strategy | South Africa, Kenya, Uganda, Nigeria, Benin, Ghana | | | | |
| Pilot | | | South Africa, Kenya, Senegal | | South Africa, Uganda, Kenya, Nigeria, Ghana |
| Solutions shaping | South Africa, Uganda, Kenya, Nigeria, Ghana, | South Africa | | South Africa | |
| Solutions established | | | South Africa (certain) | | |

Source: adapted from EMPA (2010).

The prerequisites that were identified for the success of the policy framework on e-waste management include: strong government commitment; monitoring and evaluation of the policy

implementation hence allowing for flexibility and adaptation to the constantly changing ICT and e-waste landscape; strong partnerships and collaborations; and the need to consider an awareness framework. The road map recommended by the Task Force to meet these prerequisites offer an approach for the regional project. Elements of this road map include:

- Sustainable and adequate e-waste management in the region;
- Well defined framework (harmonised strategies, policies and guidelines gaps in existing legal framework for e-waste identified and to be addressed, Law enforcement regulations in place, set up of an institutional framework
- Development of a model policy framework to guide the member countries in developing and implementing their specific e-waste management policies where all relevant ministries and agencies have clear roles and responsibilities, e.g., Ministry of Telecom to spearhead the policy framework seconded by the Ministry of Trade and Economy, the Ministry of Environment and the Ministry of Health with the regulatory bodies under the respective ministries providing technical support and guidance.
- Resources- Human, Finance, infrastructure development
- Private sector engagement by creating an enabling environment and incentives;
- Targeted consumers through adequate awareness campaigns.

ANNEX C: Overview of the use of electrical and electronic equipment and e-wastes in SSA countries

Total Population, Estimated EEE Volume, Estimated E-waste Volume, ICT, Mobile Phone and Household Computer in SSA countries

| Year 2012 | Total Population | | Urban Population | | EEE Total | | E-waste Total | | EEE/ Capita Lower Upper Bound | | E-waste/ Capita Lower Upper Bound | | SSA ICT Import | | SSA ICT Export and Re- Export | | Mobile Phone Lines | | % HH with Comp uter |
|-----------------------|------------------|-----|------------------|-----|-----------|-----|---------------|-----|--|-----------|---|-----------|-------------------|-----|--|-----|--------------------------|-----|---------------------------------|
| | Mn | % | Mn | % | Kiloton | % | Kiloton | % | Kg/Capita | Kg/Capita | Kg/Capita | Kg/Capita | US\$ Mn | % | US\$ Mn | % | Mn | % | % |
| Angola | 20.8 | 2.3 | 12.5 | 3.6 | 115.0 | 5.8 | 73.8 | 5.8 | 5.5 | 9.2 | 3.5 | 5.9 | - | 0.0 | - | 0.0 | 9.8 | 1.8 | 7.1 |
| Benin | 10.1 | 1.1 | 4.6 | 1.3 | 14.6 | 0.7 | 9.1 | 0.7 | 1.4 | 3.2 | 0.9 | 2.0 | 23.2 | 0.1 | 0.4 | 0.0 | 8.4 | 1.6 | 3.6 |
| Botswana | 2.0 | 0.2 | 1.2 | 0.4 | 26.6 | 1.3 | 18.5 | 1.5 | 13.3 | 21.3 | 9.2 | 14.8 | 194.5 | 1.2 | 11.5 | 0.8 | 3.1 | 0.6 | 11.0 |
| Burkina Faso | 16.5 | 1.8 | 4.5 | 1.3 | 22.6 | 1.1 | 14.0 | 1.1 | 1.4 | 5.0 | 0.9 | 3.1 | 43.8 | 0.3 | 0.1 | 0.0 | 10.0 | 1.8 | 2.1 |
| Burundi | 9.8 | 1.1 | 1.1 | 0.3 | 5.2 | 0.3 | 3.2 | 0.3 | 0.5 | 4.7 | 0.3 | 2.9 | 13.8 | 0.1 | 0.2 | 0.0 | 2.2 | 0.4 | 0.1 |
| Cabo Verde | 0.5 | 0.1 | 0.3 | 0.1 | 2.0 | 0.1 | 1.3 | 0.1 | 4.1 | 6.4 | 2.6 | 4.1 | 32.2 | 0.2 | 0.2 | 0.0 | 0.4 | 0.1 | 20.4 |
| Cameroun | 21.7 | 2.4 | 11.4 | 3.3 | 47.1 | 2.4 | 29.4 | 2.3 | 2.2 | 4.1 | 1.4 | 2.6 | 163.2 | 1.0 | 1.3 | 0.1 | 13.1 | 2.4 | 7.2 |
| CAR | 4.5 | 0.5 | 1.8 | 0.5 | 3.6 | 0.2 | 2.2 | 0.2 | 0.8 | 2.0 | 0.5 | 1.3 | - | 0.0 | - | 0.0 | 1.1 | 0.2 | NA |
| Chad | 12.4 | 1.4 | 2.7 | 0.8 | 20.0 | 1.0 | 12.5 | 1.0 | 1.6 | 7.3 | 1.0 | 4.6 | - | 0.0 | - | 0.0 | 4.4 | 0.8 | 0.4 |
| Comoros | 0.7 | 0.1 | 0.2 | 0.1 | 0.8 | 0.0 | 0.5 | 0.0 | 1.1 | 4.1 | 0.7 | 2.5 | - | 0.0 | - | 0.0 | 0.3 | 0.1 | NA |
| Congo, D. Rep. | 65.7 | 7.2 | 22.9 | 6.7 | 26.1 | 1.3 | 16.5 | 1.3 | 0.4 | 1.1 | 0.3 | 0.7 | - | 0.0 | - | 0.0 | 20.1 | 3.7 | 0.7 |

| Year 2012 | Total Population | | Urban Population | | EEE Total | | E-waste Total | | EEE/ Capita Lower Upper Bound | | E-waste/ Capita Lower Upper Bound | | SSA ICT Import | | SSA ICT Export and Re-Export | | Mobile Phone Lines | | % HH with Computer |
|-----------------------|------------------|------|------------------|-----|-----------|-----|---------------|-----|-------------------------------|-----------|-----------------------------------|-----------|----------------|-----|------------------------------|-----|--------------------|-----|--------------------|
| | Mn | % | Mn | % | Kiloton | % | Kiloton | % | Kg/Capita | Kg/Capita | Kg/Capita | Kg/Capita | US\$ Mn | % | US\$ Mn | % | Mn | % | % |
| Congo Rep. | 4.3 | 0.5 | 2.8 | 0.8 | 17.7 | 0.9 | 11.3 | 0.9 | 4.1 | 6.4 | 2.6 | 4.1 | 28.5 | 0.2 | 1.7 | 0.1 | 4.3 | 0.8 | 4.0 |
| Côte d'Ivoire | 19.8 | 2.2 | 10.3 | 3.0 | 37.3 | 1.9 | 23.1 | 1.8 | 1.9 | 3.6 | 1.2 | 2.2 | 259.4 | 1.6 | 23.9 | 1.6 | 18.1 | 3.3 | 1.8 |
| Eritrea | 6.1 | 0.7 | 1.3 | 0.4 | 4.2 | 0.2 | 2.6 | 0.2 | 0.7 | 3.1 | 0.4 | 1.9 | - | 0.0 | - | 0.0 | 0.3 | 0.1 | 0.3 |
| Ethiopia | 91.7 | 10.1 | 15.9 | 4.6 | 97.3 | 4.9 | 60.2 | 4.7 | 1.1 | 6.1 | 0.7 | 3.8 | 364.0 | 2.2 | 5.3 | 0.4 | 20.5 | 3.8 | 1.4 |
| Gabon | 1.6 | 0.2 | 1.4 | 0.4 | 22.5 | 1.1 | 15.7 | 1.2 | 13.8 | 15.9 | 9.6 | 11.1 | 50.6 | 0.3 | 1.4 | 0.1 | 2.9 | 0.5 | 7.6 |
| Gambia | 1.8 | 0.2 | 1.0 | 0.3 | 3.3 | 0.2 | 2.0 | 0.2 | 1.8 | 3.2 | 1.1 | 2.0 | 5.6 | 0.0 | 0.2 | 0.0 | 1.5 | 0.3 | 5.7 |
| Ghana | 25.4 | 2.8 | 13.3 | 3.9 | 77.3 | 3.9 | 48.6 | 3.8 | 3.0 | 5.8 | 1.9 | 3.6 | 784.5 | 4.8 | 7.2 | 0.5 | 25.6 | 4.7 | 13.8 |
| Guinea | 11.5 | 1.3 | 4.1 | 1.2 | 11.6 | 0.6 | 7.2 | 0.6 | 1.0 | 2.8 | 0.6 | 1.7 | 70.8 | 0.4 | 0.4 | 0.0 | 4.8 | 0.9 | 1.5 |
| Guinea Bissau | 1.7 | 0.2 | 0.7 | 0.2 | 1.0 | 0.1 | 0.6 | 0.1 | 0.6 | 1.4 | 0.4 | 0.9 | 2.0 | 0.0 | - | 0.0 | 1.0 | 0.2 | NA |
| Guinea, Equat. | 0.7 | 0.1 | 0.3 | 0.1 | 23.1 | 1.2 | 16.5 | 1.3 | 31.3 | 79.0 | 22.4 | 56.5 | - | 0.0 | - | 0.0 | 0.5 | 0.1 | NA |
| Kenya | 43.2 | 4.7 | 10.5 | 3.1 | 71.4 | 3.6 | 44.4 | 3.5 | 1.7 | 6.8 | 1.0 | 4.2 | 826.7 | 5.1 | 70.6 | 4.8 | 30.7 | 5.7 | 3.6 |
| Lesotho | 2.1 | 0.2 | 0.6 | 0.2 | 3.7 | 0.2 | 2.3 | 0.2 | 1.8 | 6.4 | 1.1 | 4.0 | 43.4 | 0.3 | 42.9 | 2.9 | 1.5 | 0.3 | NA |

| Year 2012 | Total Population | | Urban Population | | EEE Total | | E-waste Total | | EEE/ Capita Lower Upper Bound | | E-waste/ Capita Lower Upper Bound | | SSA ICT Import | | SSA ICT Export and Re-Export | | Mobile Phone Lines | | % HH with Computer |
|-------------------|------------------|------|------------------|------|-----------|------|---------------|------|-------------------------------|-----------|-----------------------------------|-----------|----------------|------|------------------------------|-----|--------------------|------|--------------------|
| | Mn | % | Mn | % | Kiloton | % | Kiloton | % | Kg/Capita | Kg/Capita | Kg/Capita | Kg/Capita | US\$ Mn | % | US\$ Mn | % | Mn | % | % |
| Liberia | 4.2 | 0.5 | 2.0 | 0.6 | 2.6 | 0.1 | 1.6 | 0.1 | 0.6 | 1.3 | 0.4 | 0.8 | - | 0.0 | - | 0.0 | 2.4 | 0.4 | NA |
| Madagascar | 22.3 | 2.4 | 7.4 | 2.2 | 20.2 | 1.0 | 12.5 | 1.0 | 0.9 | 2.7 | 0.6 | 1.7 | 47.4 | 0.3 | - | 0.0 | 8.8 | 1.6 | 1.4 |
| Malawi | 15.9 | 1.7 | 2.5 | 0.7 | 17.8 | 0.9 | 8.5 | 0.7 | 1.1 | 7.1 | 0.5 | 3.4 | 93.0 | 0.6 | 3.7 | 0.3 | 4.6 | 0.9 | 4.0 |
| Mali | 14.9 | 1.6 | 5.3 | 1.5 | 16.4 | 0.8 | 10.1 | 0.8 | 1.1 | 3.1 | 0.7 | 1.9 | 69.7 | 0.4 | 2.1 | 0.1 | 14.6 | 2.7 | 6.2 |
| Mauritania | 3.8 | 0.4 | 1.6 | 0.5 | 7.1 | 0.4 | 4.4 | 0.3 | 1.9 | 4.5 | 1.2 | 2.8 | - | 0.0 | - | 0.0 | 4.0 | 0.7 | 3.0 |
| Mauritius | 1.3 | 0.1 | 0.4 | 0.1 | 17.3 | 0.9 | 11.9 | 0.9 | 13.4 | 42.5 | 9.2 | 29.3 | 261.1 | 1.6 | 20.2 | 1.4 | 1.5 | 0.3 | 44.7 |
| Mozambique | 25.2 | 2.8 | 9.8 | 2.9 | 24.7 | 1.2 | 15.3 | 1.2 | 1.0 | 2.5 | 0.6 | 1.6 | 178.0 | 1.1 | 0.2 | 0.0 | 9.1 | 1.7 | 4.0 |
| Namibia | 2.3 | 0.2 | 0.4 | 0.1 | 15.2 | 0.8 | 9.9 | 0.8 | 6.7 | 37.1 | 4.4 | 24.1 | 202.3 | 1.2 | 27.4 | 1.9 | 2.1 | 0.4 | 13.0 |
| Niger | 17.2 | 1.9 | 8.6 | 2.5 | 12.8 | 0.6 | 7.9 | 0.6 | 0.7 | 1.5 | 0.5 | 0.9 | 38.2 | 0.2 | 3.8 | 0.3 | 5.4 | 1.0 | 1.5 |
| Nigeria | 168.8 | 18.5 | 84.8 | 24.8 | 420.4 | 21.0 | 263.0 | 20.6 | 2.5 | 5.0 | 1.6 | 3.1 | 2,958.4 | 18.1 | 3.4 | 0.2 | 112.8 | 20.8 | 9.3 |
| Rwanda | 11.5 | 1.3 | 2.2 | 0.6 | 14.0 | 0.7 | 8.7 | 0.7 | 1.2 | 6.3 | 0.8 | 3.9 | 153.5 | 0.9 | 1.4 | 0.1 | 5.7 | 1.1 | 2.0 |
| Sao Tome | 0.2 | 0.0 | 0.1 | 0.0 | 0.4 | 0.0 | 0.2 | 0.0 | 2.0 | 3.2 | 1.3 | 2.0 | 3.7 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | NA |

| Year 2012 | Total Population | | Urban Population | | EEE Total | | E-waste Total | | EEE/ Capita Lower Upper Bound | | E-waste/ Capita Lower Upper Bound | | SSA ICT Import | | SSA ICT Export and Re-Export | | Mobile Phone Lines | | % HH with Computer |
|---------------------|------------------|-----|------------------|-----|-----------|------|---------------|------|-------------------------------|-----------|-----------------------------------|-----------|----------------|------|------------------------------|------|--------------------|------|--------------------|
| | Mn | % | Mn | % | Kiloton | % | Kiloton | % | Kg/Capita | Kg/Capita | Kg/Capita | Kg/Capita | US\$ Mn | % | US\$ Mn | % | Mn | % | % |
| Senegal | 13.7 | 1.5 | 5.9 | 1.7 | 24.9 | 1.2 | 15.5 | 1.2 | 1.8 | 4.2 | 1.1 | 2.6 | 137.3 | 0.8 | 11.6 | 0.8 | 11.5 | 2.1 | 8.0 |
| Seychelles | 0.1 | 0.0 | 0.0 | 0.0 | 1.9 | 0.1 | 1.4 | 0.1 | 21.5 | 39.8 | 16.2 | 30.0 | 17.9 | 0.1 | 0.2 | 0.0 | 0.1 | 0.0 | 45.0 |
| Sierra Leone | 6.0 | 0.7 | 2.4 | 0.7 | 7.9 | 0.4 | 4.9 | 0.4 | 1.3 | 3.3 | 0.8 | 2.1 | - | 0.0 | - | 0.0 | 2.2 | 0.4 | NA |
| Somalia | 10.2 | 1.1 | 3.9 | 1.1 | 0.0 | 0.0 | 0.0 | 0.0 | - | - | - | - | - | 0.0 | - | 0.0 | 2.3 | 0.4 | NA |
| South Africa | 52.3 | 5.7 | 32.6 | 9.5 | 508.7 | 25.4 | 339.3 | 26.6 | 9.7 | 15.6 | 6.5 | 10.4 | 7,952.0 | 48.6 | 1,038.5 | 70.2 | 68.4 | 12.6 | 21.5 |
| South Sudan | 10.8 | 1.2 | 2.0 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | - | - | - | - | - | 0.0 | - | 0.0 | 2.3 | 0.4 | NA |
| Sudan | 37.2 | 4.1 | 12.4 | 3.6 | 75.2 | 3.8 | 47.0 | 3.7 | 2.0 | 6.1 | 1.3 | 3.8 | 308.4 | 1.9 | 0.2 | 0.0 | 27.7 | 5.1 | 14.0 |
| Swaziland | 1.2 | 0.1 | 0.3 | 0.1 | 5.6 | 0.3 | 3.6 | 0.3 | 4.6 | 21.6 | 2.9 | 13.7 | 58.6 | 0.4 | 1.0 | 0.1 | 0.8 | 0.1 | 10.7 |
| Tanzania | 47.8 | 5.2 | 13.0 | 3.8 | 69.1 | 3.5 | 42.9 | 3.4 | 1.4 | 5.3 | 0.9 | 3.3 | 374.7 | 2.3 | 8.4 | 0.6 | 27.2 | 5.0 | NA |
| Togo | 6.6 | 0.7 | 2.6 | 0.7 | 6.5 | 0.3 | 4.0 | 0.3 | 1.0 | 2.5 | 0.6 | 1.6 | 72.2 | 0.4 | 2.1 | 0.1 | 3.3 | 0.6 | 2.3 |
| Uganda | 36.3 | 4.0 | 5.8 | 1.7 | 47.6 | 2.4 | 29.5 | 2.3 | 1.3 | 8.2 | 0.8 | 5.1 | 344.0 | 2.1 | 184.0 | 12.4 | 16.4 | 3.0 | NA |
| Zambia | 14.1 | 1.5 | 5.6 | 1.6 | 22.3 | 1.1 | 13.8 | 1.1 | 1.6 | 4.0 | 1.0 | 2.5 | 191.7 | 1.2 | 3.5 | 0.2 | 10.5 | 1.9 | 2.4 |

| Year 2012 | Total Population | | Urban Population | | EEE Total | | E-waste Total | | EEE/ Capita Lower Upper Bound | | E-waste/ Capita Lower Upper Bound | | SSA ICT Import | | SSA ICT Export and Re-Export | | Mobile Phone Lines | | % HH with Computer |
|---------------------|------------------|-------|------------------|-------|-----------|-------|---------------|-------|-------------------------------|-----------|-----------------------------------|-----------|-----------------|-----|------------------------------|-----|--------------------|-------|--------------------|
| | Mn | % | Mn | % | Kiloton | % | Kiloton | % | Kg/Capita | Kg/Capita | Kg/Capita | Kg/Capita | US\$ Mn | % | US\$ Mn | % | Mn | % | % |
| Zimbabwe | 13.7 | 1.5 | 5.4 | 1.6 | 6.5 | 0.3 | 4.0 | 0.3 | 0.5 | 1.2 | 0.3 | 0.8 | - | 0.0 | - | 0.0 | 12.6 | 2.3 | 5.9 |
| <i>WB Adjust.</i> | | | | | | | | | | | | | 4,694.2 | | 565.7 | | - | | |
| SSA Total | 912.2 | 100.0 | 342.6 | 100.0 | 1,999 | 100.0 | 1,275 | 100.0 | | | | | 21,062.6 | | 2,044.9 | | 541.3 | 100.0 | 7.80 |
| Africa Total | | | | | | | | | | | | | 23,000.0 | | | | | | |
| Weighted av. | | | | | 145 | | 92 | | 2.2 | 5.9 | 1.4 | 3.8 | | | | | | | |

Column Specific Legend: <1 ≥1 & <4 ≥4

Source: Adapted from WDI (2014); STEP Initiative website: <www.step-initiative.org>; and UNCTAD Stat: <http://unctad.org>.