E4813

GHANA CLIMATE INNOVATION CENTRE PROJECT (GCICP)

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF)

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ACRONYMS

Acronym	Meaning
CIC	Climate Innovation Center
CTP	Climate Technology Programme
DANIDA	Danish Development Assistance Programme
GCIC	Ghana Climate Innovation Center
CITF	Climate Innovation Multi-donor Trust Fund
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESSF	Environmental and Social Screening Form
EIA	Environmental Impact Asssessment
PPE	Personal Protective Equipment
WEEE	Waste Electrical & Electronic Equipment
NGO	Non-Governmental Organization
PoC	Proof of Concept
PCN	Project Concept Note
RAP	Resettlement Action Plan
SME	Small and Medium scale Enterprises
MFI	Micro Finance Institutions
SSF	Social Screening Form

EXECUTIVE SUMMARY

infoDev's Global Climate Technology Program (CTP) is creating a global network of Climate Innovation Centers (CICs) that provide a country-driven approach to climate change and allow countries to achieve their green growth objectives. It (infoDev) supports growth-oriented entrepreneurs through creative and path-breaking venture enablers and manages a global network aimed at building global entrepreneurial and SME communities of practice through its network to share and disseminate best practices and facilitate collaboration. The CTP offers a unique platform to test and develop innovative models for supporting growth oriented climate technology enterprises and to share learning from the various countries within the World Bank Group and with other relevant stakeholders. It targets the early stages of innovation, including the key role of entrepreneurs and growth-oriented startups.

Eight CICs are currently being implemented in Asia, the Caribbean and Africa including Ghana- *Ghana Climate Innovation Centre (GCIC)*.The establishment of the GCIC Project is being supported by infoDev through a consortium led by Ashesi University. The GCIC in Ghana will act as a mechanism to maximize climate technology innovation. The GCIC will be housed within Ashesi University, and supported by a consortium of partners; (i) Ernst and Young Ghana, (ii) SNV Netherlands Development Organization, and (iii) United Nations University Institute for Natural Resources in Africa (UNU-INRA).The GCIC is funded by DANIDA. The GCIC project is based on the Ghana Climate Innovation Center Business Plan that is the result of an infoDev led feasibility study and stakeholder engagement process carried out in 2013.

The most critical constraints and gaps identified in climate innovation are related to technology, company, finance, market and policy. Additionally, the feasibility study identified five primary sectors in which the GCIC should focus its efforts: (i) Energy Efficiency (ii) Domestic Waste Management, (iii) Solar Energy, (iv) Water Management and Purification and (v) Climate Smart Agriculture. The GCIC will provide a range of services, such as access to finance, access to market information and access to mentoring (business advisory and training services)to entrepreneurs and SMEs who are engaged in starting and scaling climate technology ventures. As part of its access to finance services, the Center will provide dedicated proof of concept funding and seed capital financing to entrepreneurs and SMEs. The GCIC, over a five-year period, will provide funding for up to 200 climate technology entrepreneurs, and equity investment to over 194 companies over the same period.

Environmental quality and sustainable management of natural resources play important roles for Ghana's prospects to reduce poverty, enhance welfare and sustain economic growth. The GCIC project has triggered the World Bank's Environmental Assessment Policy (OP/4.01) and has been assigned a category B (Partial Assessment) to account for its minimal and localized potential environmental and social impacts which can be easily mitigated. At this stage of project preparation, the exact location of the beneficiary SMEs subproject activities are not yet known, hence, it is difficult to clearly state the positive and negative environmental and social impacts associated with the proposed subproject works. A framework approach has been adopted through the preparation of this Environmental and Social Management Framework

(ESMF) to comply with Bank triggered policy and provide a mechanism through which all legible subprojects will be screened to identify their potential environmental and social impacts prior to approval for funding.

Though it is difficult to predict and exhaustively cite the environmental and social impacts of small and medium innovative technology ventures, some of the significant environmental and social issues to be considered at this stage may include: air pollution, water pollution, light industrial wastes, effluent discharges and household wastes, among others. As far as the positive environmental and social effects are concerned, by ensuring access to finance, market information, gender and technology led innovation, access to policy support and regional partners, the GCIC will achieve the dual aim of reducing poverty and tackling climate change and vulnerability to increase resilience. The partnership program will help support economic growth, promote new green jobs, industries and innovation, and generate local environmental and social benefits. In order to promote the growth of innovative climate technology ventures that promote climate resilience and green growth, the work of the CIC will give due emphasis to technologies, SMEs, and private ventures, that are environmentally and socially sustainable and acceptable. Thus, CIC will foster clean technologies and business enterprises that use and develop clean and safe technologies that are energy efficient and viable. Other positive impacts include carbon mitigation, access to energy and water for people and benefits in terms of contribution to carbon sequestration, supply of fuel wood and sources of income for households. Further to this, SMEs are expected to be competitive in terms of job creation, while promoting women and girl led innovations.

The ESMF will serve as a safeguard framework to examine the environmental and social impacts of the private SMEs and technologies to be financed and supported under the GCIC program. The ESMF has been prepared based to comply with the policy requirements of the World Bank's environmental and social safeguard policies, as well as the environmental legislative requirements of Ghana. It will provide the necessary guidance to the GCIC in the selection and preparation of funding proposals for the sustainable environmental and social management of business ventures where the exact locations and potentially negative localized impacts are not known prior to project appraisal. The GCIC program will address priority climate innovation objectives and is thus expected to have positive environmental impacts.

The GCIC supported SMEs will have positive social impacts such as job creation for locals to obtain employment. In terms of improved skills, technical staff will have enhanced capacity to monitor the environment in a more reliable manner. Increased levels of awareness among different stakeholders will help them appreciate and deal with the environment issues with a friendly approach. The CIC's main social, economic and environmental positive impacts will result from the accelerated growth of supported technologies.

Notwithstanding the positive effects, site specific and less obvious localized environmental and social negative impacts may happen in relation to investment of small and medium private enterprises and technology ventures. These impacts may include air pollution due to dusts and fumes, soil and water pollution and waste from electrical, electronic, and metallic equipment, byproduct or, that would be produced as a result of construction and installation, manufacture and operation of SMEs. These wastes can pose a potential threat to human health and the

environment when improperly managed. In addition generation of particulate matter (dust) and emission of exhaust combustion of gas products into the atmosphere during construction and operation of facilities will impact ambient air quality. SME owners should be responsible for controlling air, soil and water pollution. Due to the fact that the GCIC would support a wide range of SME business ventures, there are also possibilities of a few adverse social impacts due to particular activities such as poor safety, health and environment for workers, unsafe workplace conditions, which among others may cause adverse impacts on people and society. In addition to the aforementioned, child labor may occur in some Ghanaian SMEs. The GCIC should not support any SME engaged in child labor and should prohibit employment of under-aged persons by SMEs, particularly in hazardous works such as machine workshops, laboratories, slaughterhouses, cold storages, and in manufacturing or production of bio-fuels and collection of solid wastes. Incidence of HIV/AIDS rise could be a concern due to influx of people to the sub-project localities in search of employment opportunities, thereby contributing to the levels of HIV/AIDS prevalence in the areas.

Unsafe working conditions can pose serious health risks to both workers and the wider environment. There should be proper arrangement for a healthy, safe and secure environment for workers. SMEs should have a plan to manage waste and control noise pollution in the working area. The worker should not be engaged in any work without suitable safety gear, adequate prior direction and training.

Potential dangers likely to originate from technological or industrial accidents, dangerous procedures, infrastructure failures or certain human activities, which may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation, should also be considered during screening of business ventures for funding. In order to cope with these potential adverse impacts, the environmental and social screening process proposed under the ESMF will be applied in such a way as to ensure that potential negative impacts are prevented and/or mitigated appropriately, and positive impacts are enhanced.

As the GCIC has been classified as EA Category B, all category A sub-projects are automatically excluded from financing under this project. At this stage the actual locations and activities of SMEs that will benefit from financing under this grant are unknown and thus potential adverse environmental and social impacts of future investments could not be clearly determined prior to the appraisal of this Project. This Environmental and Social Management Framework (ESMF) has been prepared to guide the screening of sub-projects and the preparation of the relevant safeguards instruments which may be needed once sub-project activities and locations are known. Should the outcome of the screening indicate that significant negative impacts are likely to occur, safeguard tools such as environmental and social impact assessments (ESIA) or environmental and social management plans (ESMP)may have to be prepared and implemented based on guidance from the ESMF.

All subprojects will be registered with the Ghana EPA and appropriate permits will be secured for any qualifying subproject prior to project implementation in order to comply with Ghana environmental legislative requirements.

Project affected persons within the environs of the implementing SMEs shall be consulted through various means (face-to-face, workshops, key stakeholder engagement meetings etc.) to gauge their perceptions of potential concerns associated with the proposed subproject. All concerns from the project affected persons shall be logged and considered in the subproject works design to avoid, minimize or compensate for potential environmental and social impacts. All relevant information which will help consultation with the project affected persons shall be disclosed fully in compliance with World Bank Disclosure Policy and Ghana EIA legislative requirements.

The management team of the GCIC, will (i) review all SMEs' applications, (ii) appraise the SMEs, and (iii) provide training and awareness to SMEs staff and also screen and vet SMEs for compliance with World Bank safeguards requirements before approving funding.It will also monitor environmental compliance based on management/mitigation plans prepared by the SMEs and maintain records of safeguard documents for all SMEs. The owner of the SME will conduct in-house screening for any adverse impacts, prepare a proposal and application and then submit to GCIC for funding. After it receives funding, it will implement the SME activities in line with agreed mitigation measures, and will be expected to report to the GCIC any mitigation measures taken or non-compliance.

A monitoring plan including key performance indicators and cost for implementing the ESMF and general environmental and social safeguard arrangements for this project has been included to enable relevant and appropriate budgeting.

1. INTRODUCTION

1.1 Background

Ghana has experienced impressive reductions in poverty and steady economic growth in recent years[1] advancing it from low-income to lower-middle income status in 2010, almost a decade earlier than expected[2] However, with anticipated increases in temperature, extreme weather events and unpredictable rainfall in Ghana over the next century[3], climate change poses a growing threat to this economic and developmental progress.

The impacts of climate change on Ghana's economy, people, and development prospects are projected to be substantial[4] although its contribution to climate change through greenhouse gas emissions is currently negligible[5].

The world is reorienting towards low-carbon and green growth path. Accelerating innovation and technology transfers are considered as key factors to mitigate and adapt to the present and future impacts of climate change. Accordingly, infoDev through a feasibility study in 2013 has decided to support the establishment of a Climate Innovation Centre (GCIC) to promote identified five priority sector areas in green technology, climate smart technology, and efficient energy.

The objective of the Ghana Climate Innovation Center (GCIC) is to establish local institutional capacity to support Ghanaian entrepreneurs and new ventures involved in developing profitable and locally-appropriate solutions to climate change mitigation and adaptation. Through its programs, activities and financing, the GCIC and its network of partners and stakeholders will provide a country-driven approach to solving climate, energy and resource challenges and support economic development through job creation. The program will provide targeted support, mentoring, training and funding facilitation to up to 200 companies in Ghana over 5 years.

The GCIC is housed at Ashesi University, a local institution of higher learning, and supported by a consortium of partners (Ernst & Young Ghana, SNV Netherlands Development Organization, and United Nations University Institute for Natural Resources in Africa (UNU-INRA) with i*nfoDev* managing and overseeing implementation including the provision of ongoing technical assistance, performance evaluation and importantly, linking the Center with global level activities. The GCIC will provide a holistic set of early stage financing, business support and capacity building support services to the private sector, including women and rurally based entrepreneurs and business owners working to develop, launch and grow

[1]USAID/Ghana Country Development Cooperation Strategy 2013-2017".USAID. December, 2012
[2]"No Longer Poor: Ghana's New Income Status and Implications of Graduation from IDA ". T. Moss, S. Majerowicz Center for Global Development. July, 2012
[3]"Ghana Climate Change Vulnerability and Adaption Assessment ".USAID. June 2011
[4]"Economics of Adaption to Climate Change".World Bank. 2010
[5]The World Development Indicators of the World Bank show CO2 emissions have increased from 3927.80kt in 1990 to about 9801.20kt in 2007, averaging about 0.3 metric tons, per capita

innovative climate technology ventures that promote Ghana's climate resilience and green growth.

GCIC will support innovation by offering a full suite of financing and capacity building services to technologists, entrepreneurs and SMEs that addresses challenges to starting and scaling the climate technology ventures. In addition, incubating and promoting start-ups and providing dedicated proof of concept and seed fund to entrepreneurs to bridge local funding gaps. In parallel to the above investments, GCIC also provide access to business advisory and training services, market intelligence and government engagement on policy. In this way, the GCIC acts a national focal point, coordinating efforts in promoting the growth of locally relevant climate sectors.

1.2 Purpose and Objectives of the ESMF

This ESMF has been prepared to serve as a safeguard framework to examine the environmental and social impacts of Small to Medium Enterprises (SMEs) and technologies to be supported by the GCIC program. The objectives of the ESMF are:

To establish clear procedures and methodologies for the environmental and social review, approval and implementation of small and medium business investments to be financed under the program;

To specify appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring environmental and social concerns related to program investments;

To determine the training and capacity building needs; and

To establish the budget required to implement the ESMF.

1.3 Methodology Used to Prepare the ESMF

The ESMF has been prepared in accordance with applicable World Bank safeguard policies and Ghana Environmental Assessment guidelines. The process involved Literature review; Environmental screening and scoping; Determination of potential impacts; Identification of impact mitigation measures; Preparation of an Environmental and Social Management Plan; and Preparation of sub-project guidelines. The distinct phases of the ESMF include:

Data Gathering

The ESMF Consultant assembled and evaluated relevant baseline data related to the biophysical and socioeconomiccharacteristics of the Ghanaian environment. The baseline data reviewed included:the socio-economic and entrepreneurial terrain, especially of the number of start-up businesses in the priority focus areas of the GCIC. Currently, there is a fair number of going business concerns in the renewable energy and water purification sectors, as well as in the domestic waste management sector. The business potential appears to be significantly huge, offering room for exploitation and development.

Consultations

Consultations and discussions with EPA, Ashesi, NGOs,key stakeholders such as impacted groups such as the Association of Ghana Solar Industries, and local communities are being held from November-December 2014.

Literature Review

The ESMF preparation involved document review. The GoG and the World Bank reference documents reviewed included:

Project Concept Note (PCN),

- Proposed GCIC Project Concept Note and Project Appraisal Document
- Environmental Protection Agency Act, 1994 (Act 490);
- Environmental Assessment Regulations, 1999 (LI 1652);
- National Environmental Action Plan;
- Ghana EIA Procedures; and
- World Bank's Safeguards Policies.

The approach was based on review of available project literature and other strategic planning documents at the national and sector level.

2. DESCRIPTION OF GCIC PROGRAM

GCIC will offer a full suite of financing and capacity building services to Ghanaian technologists, entrepreneurs and new ventures that address challenges to starting and scaling their climate (clean) technology businesses in sectors such as renewable energy, climate smart agriculture, energy efficiency and water management and purification. In addition to incubating promising start-ups, the GCIC will provide dedicated proof-of-concept and seed capital funding to entrepreneurs to bridge local funding gaps. In parallel to investments, the GCIC will also provide business advisory and training services, market development services, access to product testing facilities and government engagement on policy. In this way, the GCIC will act as a national focal point, coordinating efforts in promoting the growth of locally relevant climate sectors. GCIC will also provide a platform to create international business-to-business linkages, enhance knowledge sharing and facilitate trade.

2.1 Project Service Lines

The project will provide support to five main thematic service lines detailed as in the Table 2.1 below.

Table 2.1: Main Thematic Service Lines for GCIC

Service Area	Proposed Activities
Entrepreneurship and Venture Acceleration	Business advisory, mentoring, access to professional services Technical training and skills development Seminars, events and networking opportunities Office space and services for entrepreneurs and start-ups Women's entrepreneurship program
Access to Finance	Proof-of-concept grants up to USD 50,000 Direct Seed Capital Investments (debt/equity) from USD 50k-1m Facilitation of commercial investment
Market Growth and Access	Research and analytics on markets, competitors and sector trends Export promotion program Technology quality and performance information and database

Technology and Product Development	Access to technical facilities and services to design, prototype, test and demonstrate products Commercialization program for universities and research institutes involved in climate tech R&D
Policy and Regulatory Support	Advocacy with government on climate technology policy issues Research on sector policy trends and best practice Policy dialogues, roundtables and events

2.2GCIC Support Services to SMEs

Following several key stakeholder consultations via workshops, expert panels and working groups meetings, gaps and barriers to SMEs activities within the prioritized five sector areas were identified and examined and solutions to scaling climate-related businesses in Ghana were proposed through provision of the key service lines by the GCIC to the beneficiary SMEs. The following sections will explains some of the services to be provided by the GCIC to the beneficiary SMEs to address the gaps and opportunities identified.

2.2.1Access to Finance

This includes provision of flexible financing to: (i) accelerate the development of localized technologies and (ii) catalyze new climate technology businesses. It also includes provision of risk capital through highly flexible Proof of Concept (PoC) and seed funds. The PoC grant facility is designed to assist small high growth entrepreneurs and SMEs with innovative climate technologies to bridge the gap between their research and the earliest stages of a marketable innovation, including product design, demonstration and field-testing. Once the eligibility criteria have been established and the standard operating procedures have been put in place, it will be important to develop a strong business flow or pipeline for the PoC grant facility, to ensure that the best possible innovators are attracted to the GCIC grant facility and selected for PoC grants. The precise criteria for eligibility and selection for PoC funding will be agreed with the partners. To this end, a dedicated section of the GCIC website will be developed for the PoC grant facility, with public areas as well as specific areas for registered grantees (both current applicants and successful grantees). The website will be a key mechanism for ensuring visibility of PoC Grant opportunities, and publishing the successes stories of current and past PoC grantees to ensure the transparency and accountability of the grant fund, as well as to highlight potential investment opportunities and link grantees with the GCIC's networks of investors and mentors once the PoC has been established.

The GCIC business advisers will work with clients, who are eligible for funding under the seed capital fund scheme, to create a business plan that exhibits route to market and forward cash flow once the venture is likely to earn revenue and turn profit positive. GCIC will also advise

on more complex issues such as registration for tax, setting up a legal entity, health and safety procedures, staffing requirements and gaining office space.

2.2.2 Access to Entrepreneurship and Venture Acceleration Support

This includes networking SMEs to diaspora angel investors, business mentors, and technical experts while delivering training and seminars on business planning, financial management, professional development and climate technology issues. The GCIC will develop training programs in order to assist start-up companies and entrepreneurs to develop competencies in business skills, financial management, professional development, business planning, and technical issues surrounding various climate technologies.

Alongside tailored trainings for start-ups and CIC beneficiary companies, the GCIC will work during the 5-year grant period to develop the capacity to deliver large, tailor-made training programs to larger companies based upon GCIC in-house areas of technical expertise. This will increase the scope and presence of the GCIC and provide established companies with innovative solutions to inefficient energy consumption.

GCIC will also develop tailor made training programs to larger companies. These courses would involve cost recovery as a form of income for the GCIC and utilize in house expertise to provide tailor made and capacity building programs for target areas. The aim of this would be to aid the long-term retention of skills and institutional knowledge. GCIC will also partner with local universities as well as technical vocational training colleges to provide mentoring, training and seminars to students who want to start up business.

2.2.3 Access to Policy& Regulatory Support

The Access to Policy and regulatory Support service line includes facilitating dialogue between policy makers, private sector and civil society to improve policy frameworks around climate, innovation, energy, private sector development and gender equality, researching policy and benchmarking standards to determine how global best practices are to be applied in Ghana. At the initial stage of the project development, a quick assessment will be conducted to identify SMEs, MFIs, association of women entrepreneurs, youth organizations, agribusinesses and business councils, based on existing networks and contacts through affiliates and advisory organizations. Based on the result of the baseline study and a set of criterion, eligible beneficiaries will be identified. Organizations identified will be provided with technical and financial assistance and backstop support, and linked with international networks. This includes policy roundtables. To this end, regular key stakeholder workshops and roundtable discussions will be conducted on the roles, activities, and achievements of GCIC.

Research and information-sharing strategy will extend to the GCIC fellowship program for local and international experts, to share experience and conduct dialogues, seminars, and demonstrations. These fellows will be identified based on the needs and priorities of GCIC.

2.2.4 Access to Market Growth Information

This service support will include producing market studies and case reports on climate technology sectors and opportunities at a local and regional level with focus on women entrepreneurs, and maintaining a climate technology product database for products (components, sourcing, intellectual property) and consumers(certifications, costs, user guides).

Access to market information remains a huge challenge within the Ghanaian economic operating environment. Information is very fragmented and scattered, andGCIC will play a crucial role in generating information and reports from various sources and making this available to its clients as well as the wider network. The consortium will strive to create numerous opportunities to bring together SMEs, innovators, government and NGOs to enable better exchange of experiences "from the ground" so that technologies can be tailor made to suit local conditions, which will vary extensively from region to region, even within Ghana. Thus, it is necessary to conduct market analyses of priority technical areas and develop a product database

2.2.5 Access to Technology and Product Development support

This service line support will include promotion of best practice technical facilities and services to design, prototype and demonstrate projects. It will also promote commercialization of programs for universities and research institutes involved in climate technology and research and development.

2.2.6 Ensuring Women and Girl Led Innovation

The gender equity objective aims to maximize impact of the program on women and girls will benefit from gender focused studies to identify real market opportunities for this segment of the target population. Both women-owned enterprises and enterprises that provide opportunity for women and girls would be relevant targets for program support. The Sustainable agriculture forestry (Climate Smart Agriculture) technology priority area is an obvious area of opportunity in this context. This will ensure maximum leverage of the limited resources during the GCIC's first 5 years. Products and technologies which address the needs of women and girls in rural areas, reduce their workload, save time, improve working conditions, etc. can be prioritized within the limits of effective market demand. One approach to fostering gender equity in CIC technologies is to prioritize efforts to identify opportunities and entrepreneurs focused on the economic activities of women and girls.

2.3. Project Components

The project will have two main components to help establish the GCIC (Centre) and its incubation services as well as provide investment support to beneficiary SMEs to address the five priority climate technology areas. The two main components are as follows;

2.3.1 Component 1: Climate Innovation Center Establishment and Incubation Services

This project component will cover all the service lines in Table 2.1 except the investment portion of the financing service line. Sub-grants to SMEs will also be included in this component.

2.3.2 Component 2: Seed Facilitating Facilities

This project component will cover the investment portion of the financing service line through technology and product transfer.

2.4Institutional and Implementation Arrangements

The GCIC will be hosted by Ashesi University supported by a consortium of partners (Ernst and Young Ghana, SNV Netherlands Development Organization, and United Nations University Institute for Natural Resources in Africa (UNU-INRA)with infoDev managing and

overseeing implementation including the provision of ongoing technical assistance, performance evaluation and linking the Center with global level activities. Ashesi will report to *info*Dev and the *info*Dev Climate Innovation Multi-donor Trust Fund (CITF) Steering Committee to ensure effective and successful execution of the program in accordance with required fiduciary and financial management practices.

The GCIC will have its own internal organizational structure which will comprise of an advisory committee, a management team and key staff.

Advisory Committee (AC):

An Advisory Committee will advise Ashesi on technical elements related to planning, strategy and business development. It will include up to 5 members, to be composed of relevant private sector and government representation and will be nominated by the GCIC in collaboration with *info*Dev and founding partners.

These memberships, which will be provided on a two-year rotating basis, will assist in forming linkages with various public and private partners to help achieve its mandate. The AC will also ensure appropriate coordination is made with existing DANIDA and founding partner initiatives. The CIC will consult *info*Dev and funding partners on changes in the committee's structure over the duration of the program. The AC, once established, may organize separate bodies that, can advise on specialties based on technology sectors. For example, the GCIC may have an advisory sub-committee on 'waste management technologies'.

Management Team

In accordance with the organizational design, program budgets will be managed by a management team led by the GCIC CEO. The CEO will be responsible for the day-to-day operations of the Center, including oversight of programs, reporting to i*nfo*Dev, the host and advisory committee, developing relationships, setting strategic objectives and fund-raising. The CIC CEO will be supported by a *Senior Marketing and Communications Officer*who will lead the promotion, branding and dissemination of the Center's programs and services. The CEO will alsobe supported directly by *Procurement and Financial Management Specialists*to ensure appropriate fiduciary duties are enacted and procurement guidelines followed and a *Monitoring and Evaluation Specialist*to build and implement all M&E frameworks and systems.

GCIC Staff

Other roles within the GCIC include an Access to Finance Manager who will manage the budgets for the POC grants and the investment facilitation activities. Other Managers will manage the budgets for the Entrepreneurship, Technology Development and Market Growth and Access service lines. Business Advisors will handle advisory work to GCIC clients, with additional Advisors added as the GCIC takes on more clients. A Policy Fellow will lead the policy advocacy and other related analytical products while a *Gender and Rights Specialis*t will have the critical role of ensuring that the Center's Women Entrepreneurship program and Rights focus is mainstreamed, monitored, evaluated and directed throughout the GCIC's operations.

3. POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK FOR ENVIRONMENTAL MANAGEMENT.

This section provides an overview of the relevant policies, laws and regulations specifically addressing sectors relevant to the GCIC project. It focuses first on the environmental legislation, policies, frameworks and procedures that are likely to be applicable to beneficiary SME subproject activities associated with this investment assistance and other pertinent planning related matters.The relevant policy institutional implementing agencies (sector ministries and Agencies) have been listed together with their GCIC specific project functions.

The environmental policy and EA legislation and procedures of Ghana and those of the World Bank, which are relevant to the GCIC Project, are outlined in the following sections. In principle, the two sets of policies and procedures on environmental and social requirements and assessments are similar in many respects.

3.1 NATIONAL ENVIRONMENTAL REQUIREMENTS

3.1.1 Ghana's Environmental Policy

The environmental policy of Ghana formulated in the National Environmental Action Plan (NEAP) of 1993 hinges strongly on 'prevention' as the most effective tool for environmental protection. The policy aims at a sound management of resources and environment, and the reconciliation between economic planning and environmental resources utilization for sustainable national development. It also seeks among others, to institute an environmental quality control and sustainable development programs by requiring prior EA of all developments, and to take appropriate measures to protect critical eco-systems, including the flora and fauna they contain against harmful effects, nuisance or destructive practices. The adoption of the NEAP led to the enactment of the EPA Act 1994 (Act 490); and subsequently the passing of the Ghana EIA Procedures into the EA Regulations, 1999 (LI 1652).

3.1.2 The Environmental Protection Agency Act

The Environmental Protection Agency (EPA) Act, 1994 (Act 490) grants the Agency enforcement and standards setting powers, and the power to ensure compliance with the Ghana EA requirements/procedures. Additionally, the Agency is required to create environmental awareness and build environmental capacity as relates all sectors, among others. The Agency (including its Regional and District Offices) is also vested with the power to determine what constitutes an 'adverse effect on the environment' or an activity posing 'a serious threat to the environment or public health', to require EAs, EMPs, Annual Environmental Reports (AERs), etc. of an 'undertaking', to regulate and serve an enforcement notice for any offending or non-complying undertaking.

The Agency is required to conduct monitoring to verify compliance with given approval/permit conditions, required environmental standard and mitigation commitments. Furthermore, a requirement by EPA for an EA precludes any authorizing MDA from licensing, permitting, approving or consenting such undertaking, unless notified otherwise.

3.1.3 EA Regulations and Procedures

The EA Regulations combine both assessment and environmental management systems. The regulations prohibit commencing an undertaking/activity without prior registration and

environmental permit (EP). Undertakings are grouped into schedules for ease of screening and registration and for EP. The schedules include undertakings requiring registration and EP (Schedule 1), EIA mandatory undertakings (Schedule 2), as well as Schedule 5- relevant undertakings (located in Environmentally Sensitive Areas).

The Regulations also define the relevant stages and actions, including: registration, screening, preliminary environmental assessment (PEA), scoping and terms of reference (ToR), environmental impact assessment (EIA), review of EA reports, public notices and hearings, environmental permitting and certification, fees payment, EMP, Annual Environmental Report (AER), suspension/revocation of permit, complaints/appeals, etc.

All beneficiary SME subproject activities or 'undertakings' shall follow the required procedures to comply with the legislative requirements under the Act.

EA (Amendment) Regulations, 2002
The EA (Amendment) Regulations were made to amend sections of the EA fees regime of LI 1652 (the 'principal enactment') on fee payment for EP and certificate issued by the Agency.

3.1.4 National Water Policy

Overall Goal
Consistent with the GPRS, the overall goal of the National Water Policy is to "achieve sustainable development, management and use of Ghana's water resources to improve health and livelihoods, reduce vulnerability while assuring good governance for present and future generations". This will be achieved by addressing relevant issues under water resources management, urban water supply and community water and sanitation. For each broad area, a number of focus areas for policy considerations have been identified. Within each the main principles and challenges are listed followed by policy objectives and the corresponding measures.

Policy Objectives
The key policy objectives of applying the principles and meeting the challenges above to:

(i) Achieve sustainable management of water resources;

(ii) Ensure equitably sustainable exploitation, utilization and management of water resources, while maintaining biodiversity and the quality of the environment for future generations.

Policy Measures And /or Actions
Government will take the following measures and actions:

- Facilitate availability of water resources for industrial uses through sustainable resources management;
- Require industries, including mining operations, to develop and implement environmental management systems which take into account the impact of industries on the country's water resources;
- Fully implement the enacted requirements related to licensing of water uses (permits) and issuance of waste water (effluent) discharge permits;

- Encourage development of codes of practice for efficient water use and cleaner production technologies in industrial activities; and
- Formulate hydropower development plans to meet current and future demands in conjunction with other uses, through sustainable water resources management.

Principles And Challenges

The underlying principle in financing water resources management is meeting the social needs for water as a priority, whilerecognis1ng the economic value of water and the goods and services it provides. The main challenges are:

- Ensuring sustainability in water resources management through appropriate pricing mechanisms while ensuring equity;
- Ensuring water resources management is adequately funded and appropriate levies instituted for raw water abstraction to promote efficiency, sustainability and equity; and
- Sustaining appropriate levels of funding to the sector to meet MDGs.

All beneficiary SME subproject activities or 'undertakings' shall seek to promote these policy objectives and comply with all relevant legislative requirements.

3.1.5 Environmental Sanitation Policy

In 1999 the Ministry of Local Government published an Environmental Sanitation Policy. This Policy was prepared long after the NEAP. Sanitation is construed to have a broader meaning than waste. The Policy describes the objectives of environmental sanitation to include developing a clean, safe and pleasant physical environment in all human settlements, promoting the social, economic and physical well-being of all sections of the population.

It comprises of various activities including the construction and maintenance of sanitary infrastructure, the provision of services, public education, community and individual action, regulation and legislation.

Sustainable Waste Management

The Policy confers primary responsibility for solid waste management on the Assemblies. However, the private sector will be invited to provide the actual services under contract or franchise, as appropriate.

The Policy lists the following as acceptable technologies for solid waste disposal:

- Sanitary landfill;
- Controlled dumping with cover;
- Incineration;
- Composting; and
- Recycling

All beneficiary SME subproject activities or 'undertakings' shall seek to promote these policy objectives and comply with all relevant legislative requirements

3.1.6 Local Government Act, 1993 (Act 462)

The Local Government Act (Act 462) seeks to give a fresh legal expression to government's commitment to the concept of decentralization. It is a practical demonstration of a bold attempt to bring the process of governance to the doorstep of the populace at the Regional and more importantly, the District level.

The Metropolitan, Municipal and District Assemblies (MMDAs) created under the law, constitute the highest political authority in each district, municipality and metropolis. Among the functions of the MMDAs are the following:

- Formulate and execute plans, programmes and strategies for the effective mobilization of the resources necessary for the overall development of the MMDAs;
- Initiate programmes for the development of basic Sanitation and Water services and provide municipal works and services in the MMDAs; and
- Be responsible for the development, improvement and management of human settlements and the environment.

3.1.7 By-Laws

One of the most important provisions of the law is the power of the MMDAs to make by-laws for the purpose of the functions conferred under Act 462 or any other enactment. Most MMDAs have adopted by-laws on sanitation and waste. However, most MMDAs are still without sanitary engineered waste disposal facilities in place.

All beneficiary SME subproject activities or 'undertakings' shall seek to promote these policy objectives and comply with all relevant legislative requirements.

Other relevant acts and policies considered in the preparation of the ESMF include; Renewable Energy Act, 2011, National Climate policy Framework, National Science, Technology and Innovation Policy, 2010 and National Forestry Policy.

3.2 NATIONAL LABOUR, SAFETY AND HEALTH REQUIREMENTS

3.2.1 Factories, Offices and Shops Act

The Factories, Offices and Shops Act of 1970 (Act 328) mandates the Factories Inspectorate Department to register factories and ensure that internationally accepted standards of providing safety, health and welfare of persons are adhered to. It defines a factory to include any premises (whether in or not in a building) in which one or more persons are employed in manual labor, among others.

3.2.2 Occupational Safety and Health Policy of Ghana (Draft)

The policy statement of the Occupational Safety and Health Policy (draft 2004) is: 'to prevent accidents and injuries arising out of or linked with or occurring in the course of work, by minimizing, as far as reasonably practicable, the cause of the hazards in the working environment and, therefore, the risk to which employees and the public may be exposed'. The

policy is derived from provisions of the International Labour Organization (ILO) Conventions 155 and 161. The policy document has specific sections on objectives, scope, strategies, activities and promotion and awareness creation.

3.2.3 National Workplace HIV/AIDS Policy

The broad objectives of the policy among others, are to provide protection from discrimination in the workplace to people living with HIV and AIDS; prevent HIV and AIDS spread amongst workers; and provide care, support and counselling for those infected and affected.

3.2.4 Labour Act

The purpose of the Labour Act, 2003 (Act 651) is to amend and consolidate existing laws relating to labour, employers, trade unions and industrial relations. The Act provides for the rights and duties of employers and workers; legal or illegal strike; guarantees trade unions and freedom of associations, and establishes the Labour Commission to mediate and act in respect of all labour issues. Under Part XV (Occupational Health, Safety and

Environment), the Act explicitly indicates that it is the duty of an employer to ensure that every worker works under satisfactory, safe and healthy conditions.

3.3 THE GHANA SHARED GROWTH AND DEVELOPMENT AGENDA (GSGDA)

The 1992 Constitution provides a long-term national development imperative for Ghana through the Directive Principles of State Policy which requires that every Government must pursue policies that would ultimately lead to the "establishment of a just and free society", where every Ghanaian would have the opportunity to live long, productive, and meaningful lives.

The Ghana Shared Growth and Development Agenda (GSGDA, 2010-2013), Government responds to the 1992 constitutional injunction within the context of its *Better Ghana Agenda.* It is the belief of Government that the policies and programmes emanating from the Ghana Shared Growth and Development Agenda (GSDA) will lay the foundation to move Ghanaians closer to the long-term aspiration of a just, free and prosperous society.

3.4 THE POVERTY REDUCTION STRATEGY OF GHANA

3.4.1 GPRS I and II

The GPRS I was a comprehensive framework of policies and development strategies, programs and projects to facilitate macro-economic stability, sustainable growth and poverty reduction (2003-2005). The central goal of GPRS II (2006-2009), which built on GPRS I was to accelerate the growth of the economy to attain a middle income status. The GPRS II emphasizes the implementation of growth-inducing policies and programs with the potential to support wealth creation and sustainable poverty reduction. The document refers to the need to apply environmental impact assessment and environmental audit to ensure that the growth arising from the GPRS is environmentally sustainable.

3.5 THE WORLD BANK REQUIREMENTS

3.5.1 The Bank's Safeguard Policies

The World Bank's ten (10) plus one safeguard policies are designed to help ensure that programs proposed for financing are environmentally and socially sustainable, and thus improve decision-making. The Bank's Operational Policies (OP) is meant to ensure that operations of the Bank do not lead to adverse impacts or cause any harm. They include guidance on EA requirements.

The Safeguard Policies are lumped into Environment, Rural Development, Social Development and international Law. The ten plus one (public disclosure policy) Bank Safeguard policies are as follows: (1) Environmental Assessment (OP/BP 4.01), (2)Natural Habitat (OP/BP 4.04), (3) Pest Management (OP/BP 4.09), (4) Indigenous Peoples (OP 4.11), (5) Physical Cultural Resources (OP/BP 4.11), (6) Forestry (OP/BP 4.36), (7) Safety of Dams (OP/BP 4.37), (8) Involuntary Resettlement (OP/BP 4.12), (9) Projects in International Waterways (OP/BP 7.50), (10) Projects in Disputed Areas (OP/BP 7.60) and plus *Public disclosure Policy*.

3.5.1.1 Environmental Assessment (OP 4.01)

The OP 4.01 requires among others that screening for potential impacts is carried out early, in order to determine the level of EA to assess and mitigate potential adverse impacts. The Bank's project screening criteria group projects into three categories:

- Category A – Detailed Environmental Assessment;
- Category B - Initial Environmental Examination and
- Category C – Environmentally friendly

The EA ensures that appropriate levels of environmental and social assessment are carried out as part of project design, including public consultation process, especially for Category A and B projects. The OP 4.01 is applicable to all components of the Bank's financed projects, even for co-financed components.

3.5.1.2 Involuntary Resettlement (OP 4.12)

The Policy on Involuntary Resettlement is intended to assist displaced people arising from development projects, in order not to impoverish any affected people within the area of influence of projects. An action plan that at least restores the standard of living must be instituted, in cases where resettlement is inevitable or loss of assets and impacts on livelihood occurs.

3.5.1.3 Forestry (OP 4.36)

The OP/BP 4.36 aims at enhancing the environmental and social contribution of forested areas, and the need to reduce deforestation. The protection of forests through the control of forest-related impact of all investment operations is a concern of the policy. It promotes the restriction of operations affecting critical forest and conservation areas, while requiring that the sector and other relevant stakeholders should be consulted as appropriate.

3.5.1.4 Physical Cultural Property (OP 4. 11)

The policy is premised on the need to investigate and take inventory of cultural resources likely to be affected.

Mitigations are provided for in cases of adverse impacts on physical cultural resources. Mitigation measures should be undertaken in conjunction with the appropriate authorities, organizations and institutions that are also required to be consulted and involved in the management of cultural property.

3.5.1.5 Natural Habitats (OP 4.04)

This policy recognizes that the conservation of natural habitats is essential for long-term sustainable development.

The Bank, therefore, supports the protection, maintenance, and rehabilitation of natural habitats in its project financing. The Bank supports, and expects the borrowers to apply, a precautionary approach to natural resource management to ensure opportunities for environmentally sustainable development.

3.5.1.6 Safety of Dams (OP 4.37)

The Policy seeks to ensure that appropriate measures are taken and sufficient resources provided for the safety of dams the Bank finances. The Bank distinguishes between small and large dams, and the policy is triggered for large dams. Small dams are normally less than 15m in height; this category includes farm ponds, local silt retention dams, and low embankment tanks. For small dams, generic dam safety measures designed and supervised by experienced and competent professionals are usually adequate.

3.5.1.7 Indigenous People (OP 4.10)

The objective of the policy is: (i) ensure that the development process encourages full respect of dignity, human rights and cultural features of indigenous people; (ii) ensure they do not suffer from the detrimental effects during the development process; and (iii) ensure indigenous people reap economic and social advantages compatible with their culture. Measures to address issues pertaining to indigenous people must be based on the informed participation of the indigenous people themselves.

3.5.1.8 Bank's Policy on Disclosure (OP 17.50)

The Bank's policy on disclosure currently under review requires that all the people residing in the given areas of a project have the right to be informed of the proposed development project. Prior to project appraisal therefore, the summary of the study of the development action along with other relevant information should be disclosed to or at the level of the Bank and the project area.

3.5.2 Triggered Safeguard Policies for the GCIC Project

Beneficiary SMEs subproject activities under the five prioritized sectors within which the GCIC should develop core competencies include: appliances (e.g. cook stoves), Energy Efficient Manufacturing, Lighting and Green IT, Recycling, e-waste Management, Grid Connected Solar PV, Off-grid/Distributed Solar PV, Solar Thermal, Solar Thin Film, Concentrated solar power, Waste Water Recycling, Water Use Efficiency, Efficient Irrigation, Rain Water Harvesting , Portable Water, Waste Water Treatment, Desalination, Agri-

machinery/Equipment, Food Processing, Bio-pesticides and Fertilizers, New Resilient Crops/Seeds, Waste Management.

The project triggers the Bank's safeguards policy on Environmental and Social Assessment (OP/BP 4.01) and is classified as EA category B because the potential impacts are minimal, usually localized and can be easily mitigated. A framework (ESMF) approach was adopted and this ESMF has been prepared since the nature and scope of subproject activities as well as locations could not be identified during project preparation. When the specific location and the actual nature and scope of the proposal is known the relevant safeguards instruments such as Environmental and Social Impact Assessments (ESIA), Environmental and Social Management Plan (ESMP), etc. may be prepared and adopted prior to subproject implementation.

The World Bank Pest Management Policy (OP 4.09) will not be triggered by the activities of the beneficiary SME's because only bio pesticides which are natural and environmentally friendly will be funded by the project. No chemical pesticides will be supported by the GCIC. Only and chemical pesticides will be included in the negative project list of activities within the Project Operational Manual.

The World Bank's involuntary resettlement policy (OP 4.12) is not triggered because the investment activities under the beneficiary SMEs, will not lead to land acquisition or loss of livelihoods or assets.

Overall, the GCIC may fund activities related to sustainable agribusiness technologies, renewable energy technologies, water management and purification technologies and waste water treatment technologies some of which will require environmental and social management. Thus, private investments to be supported under GCIC program will be subjected to rigorous environmental and social screening during the planning, design and implementation stages and appropriate preventive and/or mitigation steps will be taken based on the outcome of the environmental and social screening process outlined in this ESMF.

3.6 INTERNATIONAL CONVENTIONS

Ghana is party to many international agreements such as the Treaty on Marine Life Conservation, 1966, The Convention on Prevention of Marine Pollution by Dumping of Waste and other Matter, 1972, Convention on the Prevention of Pollution from Ship, 1973/1978, Convention on the International Trade in Endangered Species of Wild Flora and Fauna, 1981, Law of the Sea, 1982, International Agreement on the Protection of Tropical Timber, 1994, Comprehensive Nuclear Test Ban Treaty (CTBT), 1996, Vienna Convention on the Protection of the Ozone Layer, 2001, United Nations Framework Convention on Climate Change (UNFCCC), 1994, The Convention on Biological Diversity (Biodiversity Treaty) 1993, and Environmental Modification Treaty, 1997.

3.8 INSTITUTIONAL FRAMEWORK (Relevant Ministries & Agencies)

3.8.1 Ministry of Environment, Science, Technology and Innovation

The Ministry of Environment, Science and Technology (MESTI) was established in 1994. Its creation was in response to a national development need to integrate environmental, scientific

technological and innovative considerations into the country's sectoral, structural and socio-economic planning processes at all levels.

The declared mission of MESTI is to establish a strong national scientific and technological base for accelerated sustainable development of the country to enhance the quality of life for all. Among other things, this will be done through the development and promotion of cost-effective use of appropriate technologies.

Among the main areas of policy thrust for MESTI, are Sanitation and Waste Management (Technical Options) and Science and Technology promotion, education and acculturation.

3.8.1.1 Functions

The functions of MESTI are:

- Protection of the environment through policy formulation and economic, scientific and technological interventions needed to mitigate any harmful impacts caused by development activities;
- Standard setting and regulatory activities with regard to the application of science and technology in managing the environment for sustainable development;
- Promotion of activities needed to underpin the standards and policies required for planning and implementation of development projects; and
- Co-ordination, supervision, monitoring and evaluation of activities that support goals and targets of the Ministry and national sustainable development.

It is to be noted that MESTI is the political focal point for United Nations Convention on Climate Change (UNFCCC) in Ghana and therefore plays a key role in activities that arise out of the implementation of the Convention.

3.8.2 Ministry of Local Government and Rural Development

The Ministry of Local Government and Rural Development (MLGRD) exists to promote the establishment and development of a vibrant and well-resourced decentralized system of local government for the people of Ghana to ensure good governance and balanced rural based development. This will be done by:

- Formulating, implementing, monitoring, evaluating and coordinating reform policies and programmes to democratize governance and decentralize the machinery of government.
- Reforming and energizing local governments to serve effectively as institutions for mobilizing and harnessing local resources for local national administration and development.
- Facilitating the development of all human settlements through community and popular participation.
- Facilitating the promotion of a clean and healthy environment.

- Facilitating horticultural development.
- Improving the demographic database for development planning and management.
- Promoting orderly human settlement development.

The pursuance of the Ministry' vision is based on two divisions:

- Local government - Strong Structures, Revenue Mobilizations and Collection, and Sanitation.
- Rural Development - Rural roads, Information and Communications Technology, Tourism and Agric Processing.

3.8.3 Ministry of Water Resources Works and Housing

The Ministry of Water Resources, Works and Housing has as its main functions the formulation and co-ordination of policies and programmes for the systematic development of the country's Sanitation and Water Services requirements in respect of Works, Housing, Water Supply and Sanitation and Hydrology. The Ministry coordinates and supervises, by way of monitoring and evaluation of the performance of both public and private agencies responding to and participating in the realization of the policy objectives established for the sector.

3.8.4 Ministry of Finance and Economic Planning

The ministry of Finance and Economic Planning is the agency that manages the central government's budget. The ongoing management of the fiscal framework for local government is a core competence of the Ministry of Finance and Economic Development (MoFEP). The Ministry has recently expressed a strong commitment to develop dedicated capacity through the decision to establish a Fiscal Decentralization Unit within the Budget Office of the Ministry. This project component will provide support directly to the Unit to assist in its establishment and the performance of its functions. Staff costs and basic administrative overheads have already been budgeted for by the Ministry from the 2011 financial year. Simultaneously, MLGRD has established the Fiscal Decentralization Secretariat (FDS). The Fiscal Decentralization Unit will work in close collaboration with the FDS as part of rolling out its activities in particular in relation to preparation of PFM reform strategies for the five core reform areas.

3.9 CONSULTATIONS

Stakeholder participation during project planning, design and implementation is widely recognized as an integral part of environmental assessment studies. Relevant stakeholders were identified and consulted through series of workshops, focus groups, interviews and surveys during both the project design and specifically during the development of this ESMF. This was meant to provide information relating to the activities of the proposed GCIC Project, create awareness and to elicit solutions for addressing concerns if any, and to integrate them into the subproject identification, selection, design, operations and management.

3.9.1 Identified Stakeholders

Some of the following stakeholders among others have been consulted for this study and they include:

- Environmental Protection Agency (EPA), Head Office and Accra West (Amasaman) office;
- The Honorable Minister and Chief Director of MESTI;
- The Director and other Officials of STI Directorate;
- The Designers of the proposed building, FAS Consult Limited;
- Director of Earth Service, an NGO;
- Centre for Energy, Environment, and Sustainable Development, at KNUST in Kumasi;
- Director of Dynamic Clean Ghana Foundation, an NGO; and
- Some Food Vendors and their patrons at the proposed project site.

3.9.2 Issues, Concerns Raised and Information Received

A number of key stakeholders were consulted including NGO's and CSO's. Table 3.1 highlights some of the key stakeholders consulted and representative concerns which they raised.

Table 3.1: Stakeholders Consulted and Their Concerns

Institution / Location	Role	Designation	Issues / Concerns Raised
EPA, Head Office, Accra	Regulator, Environment	Acting Exec Director, Technical Services	❍ Follow Act 490 and LI 1652 and Obtain EPA Permit ❍ Complete Form EA1 ❍ Obtain Environmental Permit for all subproject
MESTI	Local government	Chief Director	❍ Expect project commencement soon ❍ Will really like to be part of the innovative incubator and green growth technology proposals
Ministry of Power	Local government	Director	❍ Expect project commencement soon to supplement overall national power supply and end ongoing power outage.
Ministry of Energy	Local government	Director	❍ Expect project commencement soon to supplement overall national power supply and end ongoing power outage.
Town and Country Planning	Local government	Director	❍ Obtain all necessary planning permits for subproject implementation ❍ Subproject activities and siting must align the town and country planning master plan

Institution / Location	**Role**	**Designation**	**Issues / Concerns Raised**
Metropolitan/Municipal District Assemblies	Local government	Director	❍ Obtain all necessary planning permits for subproject implementation at the district ❍ Need for a master plan on e-waste management from subproject activities.
CWSA	Subproject facilitator	Director	❍ Sanitation and water quality risks and impacts must be considered for all subproject activities. ❍ Risk of over abstraction of groundwater must be considered. ❍ Ready to share water and sanitation baseline information for any related impact assessment and communal use.
Energy Centre-Kwame Nkrumah University of Science and Technology	Incubator/Research Institutions/Academia	Dr. Ahmad Addo	❍ Ready to share research knowledge gathered within this area. ❍ Very keen to take technical lead in this area.
Earth Service	NGO	Director	❍ Ensure Waste Segregation at source by providing bins for paper, plastic and other waste ❍ Avoid Tree Cutting as much as possible ❍ Adhere to Environmental Permit requirements ❍ E-waste management a major issue in the country and needs serious look.
Green Advocacy Ghana	NGO	Director	❍ Concerns regarding management of E-waste from SME activities ❍ Very interested in sharing knowledge on this sector within the country.
Friends of Rivers & Water Bodies	NGO	Nana Agyepong Debrah	❍ Concern about potential impact water and sensitive ecosystems.
Global Farmers Wives	NGO	Elsie Augustt	❍ Very interested in climate smart technologies ❍ Concern on full and equitable participation of vulnerable groups such as women within the Agric business
Association of Ghana Solar Industries	CSO	Deputy Director	❍ Very interested to kick start the commencement of the project. ❍ Will like to play a key role in the implementation of the subproject activities ❍ Relevant SME's should register to ensure quality assurance and quality control.

4. POTENTIAL SOCIAL AND ENVIRONMENTAL IMPACTS OF CIC PROGRAMS

This section introduces the main potential environmental and social concerns that are likely to arise from the sector activities of the beneficiary SMEs subproject investments as well as possible mitigation measures to avoid, prevent, minimize and/or compensate for the harm associated with the potential negative environmental and social impacts.

4.1 The GCIC Prioritized Sectors

The Ghana CIC program will address priority climate innovation objectives and is thus expected to have positive environmental impacts to the environment. In order to gain an overview of climate change market opportunities in Ghana a multi stakeholder consultations have been undertaken which has resulted in the prioritization of five primary climate business technology sectors for funding and support under GCIC. These sectors include; (i) Energy Efficiency (ii) Domestic Waste Management, (iii) Solar Energy, (iv) Water Management and Purification and (v) Climate Smart Agriculture. Table 4.1 below summarizes the gives details of the specific scope of works that could be undertaken by beneficiary SMEs under the GCIC project.

Table 4.1:Subproject SME activities of GCIC

	Area	**Sector**	**Technology**
1	Energy Efficiency (industrial and domestic)	Energy Efficiency	Appliances (e.g. cook stoves, SWH)
			Transmission and Distribution
			HVAC
			Energy Efficient Manufacturing
			Lighting and Green IT
2	Domestic Waste Management	Domestic Waste Management	Recycling, e-waste Management
3	Renewable Energy	Solar Energy	Grid Connected Solar PV
			Off-grid/Distributed Solar PV
			Solar Thermal
			Solar Thin Film

	Area	Sector	Technology
			Concentrated solar power
4	Water Supply Management and Purification	Water Management and Purification	Waste Water Recycling
			Water Use Efficiency
			Efficient Irrigation
			Rain Water Harvesting
			Portable Water
			Waste Water Treatment
			Desalination
5	Sustainable Agriculture Forestry	Climate Smart Agriculture	Agri Machinery/Equipment
			Food Processing
			Bio-pesticides and Fertilizers
			New Resilient Crops/Seeds
			Waste Management

4.1.1 Energy Efficiency (industrial and domestic)

The main application of this subproject component will be in the promotion of appliances (e.g. cook stoves, SWH), VAC, Manufacturing Processes, Lighting, Green IT, Transmission & Distribution.

Background and Opportunities:

In absence of rapid renewable technology implementation, Ghana's power sector may face difficulties in generating adequate power to meet increasing demand. Energy efficiency is an immediate solution to demand shortfalls in Ghana.

A series of polices and government initiatives have shaped the way for growth of Ghana's efficiency sector, particularly in the efficient lighting and appliances industries. In 2007, for example, the Ministry of Energy introduced an efficiency program to promote the adoption of

efficient lighting amongst residential consumers. The sale of high-energy intensity incandescent lamps was banned and the purchase of energy efficient compact-fluorescent lamps was mandated. The GoG also implemented a free nationwide exchange and installation program, in collaboration with the EU. The estimated cost of the program was about 15 million USD. This legislation has resulted in the distribution of 6 million CFLs and is estimated to have led to a total CO2 savings of more than 100'000 t CO2e in 2008/2009 compared with earlier years.31

The 'Promoting Appliance Energy Efficiency and Transformation of the Refrigerating Appliances Market in Ghana" program targets growth in the efficient appliance sector. This program allows people to exchange their old refrigerator for cash or a new refrigerator. Additional loans are provided to finance the purchase of new, efficient fridges. This program began in 2011 and will run until the end of 2013. It was implemented by the EC in coordination with UNDP and has an expected budget is 5.7 million USD. The GoG also expects to establish new standards for modern refrigerators[6].

There also exists huge potential for efficiency implementation in commercial organizations and large industries, as energy is poorly managed in this sector[7].

4.1.2 Domestic Waste Management

The main application of this subproject component will be in the Biogas Generation MW, Distributed Biomass Power kW, Recyclable/ Biodegradable Products and Waste-to-Energy management.

Background and Opportunities:

Rapid population growth in Ghana has led to huge increases in municipal waste production in recent years, particularly in major cities such as Accra. With roughly 4 million inhabitants and an annual growth rate of 4%, Accra[8] is the largest metropolitan area in Ghana and currently generates over 2000 tons of waste daily. This waste (per capita generated) equals 0.6kg/day[9] and consists of 80% organic waste, 10% of plastic, glass and metals, and less than 12% of paper per day[10].

Unfortunately, this increase in waste production far exceeds the capacity of the current system to manage the waste effectively. Indeed, of the thousands of tons of waste generated daily, Accra currently only has the capacity to collect 66% of it[11].

On a local level, waste is collected house-to-house or through a central container and is managed by a series of private sector firms who are scattered over 16 waste collection zones. These firms charge a fee which is most often paid by the city authority, the Accra Metropolitan

[6]"Ibid

[7]Raphael Wentemi Apeaning, Energy Efficiency and Management in Industries – a case study of Ghana's largest industrial area. Master's thesis, Linköping University, Swede, May 2012.

[8]Reference to the Greater Accra Metropolitan Area (GAMA)

[9]"Defining options for integrated management of municipal solid waste in large cities of low-income economies: the case of the Accra metropolis in Ghana". J.N. Fobil, D. Carboo, C. Clement. 2002

[10]This waste data is based on a UN report and refers to an average of Accra and other African cities - http://www.modernghana.com/news/296201/1/waste-disposal-a-dilemma-for-the-economy-and-healt.html

[11]http://www.cwru.edu/med/epidbio/mphp439/Waste_Mgmt_Accra.pdf

Authority (AMA), and covered by national budgetary allocations from the state government and internally generated funds. Although private sector firms directly manage the waste, the AMA supervises the waste collection firms, monitors the public-private partnerships, and manages the final disposal points[12].

Only 20% of the population, mostly high income and low-density neighborhoods, benefit from house-to-house collection. The remaining 80% are required to deposit their waste in central containers, shared between communities. Waste pick-up from shared facilities is highly variable as collection trucks often have trouble reaching the collection site due to poor roads. The sites are therefore only emptied when laborers are hired to use handcarts. Central pay-as you dump services are also available in some areas but residents frequently favor illegal dumping sites like ditches or drains. This infrequent service has led to large waste build-ups and street dumping in highly dense areas[13]. To add to the waste disposal problems, only 30% of all houses have toilets that flush (although 77.5% have toilets) and only 20% of houses have functioning indoor plumbing. The public facilities have been provided to accommodate this lack of plumbing but are overused and often shared by 10 or more people[14].

Disposal of large-scale industrial and house-hold waste occurs mainly at landfill sites. Accra does not have an engineered landfill site near-by and it is becoming difficult to acquire land for this purpose due to NIMBY and land disputes[15]. The lack of proper landfill facilities means that waste is transported over long distances, if at all. Further, it is feared that landfills are not properly monitored and are thus leaking of toxic substances into the soil[16]. Some recycling and reuse occurs but only on a small-scale. The recycling industry lacks support in form of logistics, training in occupational health and safety, vaccination, and access to finance[17].

E-waste is also a growing concern in Ghana. Hundreds of shipping containers full of used appliances such as refrigerators, old computers, and washing machines arrive each month. These appliances used to be sold at a premium however consumer preferences have changed in recent years due to local growth. These secondhand imports are therefore now being dumped in to Ghana's already overflowing wasteland. Indeed, 20-50 million tons of electronics are discarded each year, with 70% of these products being shipped to the poor countries, including Ghana[18].

A series of public and private schemes have been launched to improve the waste situation in Ghana. These schemes open up opportunity for innovations in the sorting, collection, transportation and disposal of waste. Privatization of the waste industry has certainly benefited the waste industry. Traditionally, waste services in Ghana were monopolized by a few select contractors. Today, 80% of waste-related services are provided by the private sector and, in

[12]ibid
[13]http://www.modernghana.com/news/296201/1/waste-disposal-a-dilemma-for-the-economy-and-healt.html
[14]Boadi K, Kuitunene M. Municipal Solid Waste Management in the Accra Metropolitan Area, Ghana. *The Environmentalist.* 2003; 23: 211-218
[15]World Bank & http://www.slideshare.net/D-Waste/the-waste-management-situation-in-accraghana-the-challenges-and-prospects
[16]http://www.ghanaweb.com/GhanaHomePage/NewsArchive/artikel.php?ID=262225
[17]http://www.ghananewsagency.org/details/Features/We-can-solve-our-waste-disposal-concerns-it-s-doable/?ci=10&ai=48423
[18]United Nations Environmental Programme .

Accra, are spread across several zones. Although the government still closely monitors the process and influences the selection process, waste collection has slowly improved over the last decade.

Zoomlion Ghana Limited, a waste management giant in Ghana, has introduced several innovative schemes such as the leasing of tricycles and other equipment to informal waste collectors. ZoomLion has also demonstrated an interest in dry anaerobic digestion of household waste. Other waste-to-energy projects in planning include a methane gas extraction from old dumpsites to sell directly to the Electricity Company of Ghana[19] and a compost facility. Further, waste management capacity building has begun in universities through modular courses in waste management and the launch of The Institute of Sanitation and Waste Management, which has been created to run waste consulting services[20].

4.1.3 Solar Energy

The main application of this subproject component will be in Grid-connected solar PV, Off-grid/ Distributed solar, Solar thermal, Solar thin film, Concentrated solar power, Solar devices (lamps, charging units, etc.)

Background and Opportunities:

Solar as a resource is abundant throughout Ghana. Indeed, the monthly average solar irradiation in Ghana is between 4 and 6kWh/m2/day, with sunshine duration of between 1,800 and 3000 hours per annum and an annual sunshine duration of one thousand eight hundred to three thousand hours[21]. Utilization of this solar energy could add to the growing grid capacity in Ghana (with an exploitable capacity of 20MW), and supplement off-grid distribution of energy, for those who do not have access to the national grid system.

Despite this solar potential, grid-scale solar is yet to be implemented in Ghana. Indeed, no large-scale solar projects exist to date although the Volta River Authority (VRA) is driving a series of pilot schemes. For example, the VRA has recently commissioned a small 2 MW solar PV grid-connected plant as a pilot project in Navrongo in the NEDCo areas of operation. The renewable energy law has been recognized as a key element in helping the project go ahead, under which the plant has been awarded a feed-in tariff for 20 years[22]. Further projects may be in the pipeline as energy companies look to utilize the renewable energy incentives offered by the Act.

The off-grid solar industry has grown over the years and will probably continue into the future. There was a sharp increase in the number of solar PV systems from 700 in 1993 to 2,530 systems in 1998. By December 2003 about 4,911 systems were installed with total installed power of 1.0 peak megawatt (MWp)[23]. The majority of installations were solar home systems

[19]http://www.ghanaweb.com/GhanaHomePage/NewsArchive/artikel.php?ID=262225
[20]http://www.slideshare.net/D-Waste/the-waste-management-situation-in-accraghana-the-challenges-and-prospects
[21]http://www.parliament.gh/assets/file/Bills/Renewable%20Energy%20Bill%202011.pdf
[22]http://www.bbc.co.uk/news/science-environment-20583663
[23]"Solar PV rural electrification and energy-poverty: A review and conceptual framework with reference to Ghana". G. Yaw Obeng and H. D. Evers. "Technology Consultancy Centre Kwame Nkrumah Univ. of Science and Technology.

(4500). Other solar devices included: water pumping (80), vaccine refrigeration (210), telecommunication (63), radio receivers (34), rural telephony (3), grid-connected (50kw) (1), and battery charging stations (20)[24]. Furthermore, according to the Institute of Economic Affairs, by 1991, there were about 335 public solar PV installations in Ghana with total estimated power of 160 kW. There has been an increasing trend ever since, and by 2003, installed power had increased to 1000 kW[25]. Today, Ghana has almost 10,000 solar-panel installations in communities that don't have access to the national power grid, according to Edward Bawa, a spokesman for the Ministry. This growth is primarily due to the GoG National Electrification Scheme (NES) lead by the Ministry of Energy of Ghana. The NES was launched in 1990 with the aim of securing electricity access for all of Ghana by 2020 through the promotion of solar installations.

Notwithstanding the progress made to serve households in un-electrified villages, challenges remain for the off-grid solar installation sector. There seems to be an unwillingness of rural households to invest in PV systems as they unfairly anticipate getting connected to the grid. Furthermore, current government policy focuses heavily on grid connections and therefore adds to the attraction of the grid and lessens the appeal of off-grid solutions, even in remote, rural community areas where the grid is unlikely to ever arrive. Finally, the initial cost of procuring the solar panels is large. It is important to remember that Ghana is a developing country and many Ghanaians still live on or below the minimum wage. Micro-loans and other innovative financing schemes for solar panels are available to some communities and thus offer some level of affordability, but many cannot afford the luxury. A survey carried out in Africa and Asia revealed that only 5 percent of rural populations could pay cash for a solar home system, 20 percent could afford it if short or medium term credit were available, and 25 percent could afford long-term credit or leasing[26].

As in other countries the issue of cost-effectiveness of off-grid storage has been one of the barriers to developing the renewable energy sector in Ghana. The issue centers on generating, storage and usage at minimal cost to the consumer. Generally on-grid has been realized as the most cost-effective option allowing individual companies to generate and store power on-grid and to draw on that power when needed. With peak load occurring in early evening, most solar installations can generate power throughout the day and store this onto the grid system.

The passing of the Renewable Energy Law, subsequent setting of the feed-in-tariff and associated policy of net metering provide the needed framework for on-grid storage of power. Net metering is a key instrument for actualizing the Feed In Tariff from renewable energy. Indeed, the Feed In Tariff is a vehicle for attracting investment into the renewable energy sector as it offers investors an opportunity to realize returns on their investment by relying on the existing electricity infrastructure.

Similar to other segments of the renewable energy sector, the primary challenge with LEDs is the absence of consumer financing, which constrains the growth of the market particularly in

[24]Ibid

[25]Ibid

[26]"Investing in Power and People. A Global Action Plan. Renewable Energy World". J. Plastow, A. Goldsmith James and James Publication: 47-59. November- December 2001

rural areas. Partnerships with microfinance institutions in rural communities to support buyers who meet a certain criteria could support market development efforts. Another intervention could target vendors and distributors who have better knowledge of the local communities and know potential buyers with some form of vendor finance.

Finally, other issues relate to the quality of the LED bulbs and lamps. LEDs bulbs and lamps are expected to have longer lives than ordinary bulbs and lamps. There has, however, been a proliferation of sub-standard LEDs bulbs and lamps with very short lifespan in the market, the frequent replacement of which is a disincentive for adoption due to higher cost implication. One of the gaps is a system to stop the importation and entry into the market of sub-standard LEDs that do not meet minimum quality standards.

4.1.4 Water Management and Purification

The main application of this subproject component will be in Waste Water Recycling, Water Use Efficiency, Efficient irrigation, Rain Water Harvesting, Portable Water, Waste Water Treatment, Desalination

Background and Opportunities:

Several opportunities exist in the water sector as a result of the growing gap between clean water supply and demand. Water is primarily used for drinking, washing and cooking. The main source of drinking water in Ghana's cities is surface water. In smaller and more rural communities, drinking water is sourced from the ground. River water is used for washing.

Unfortunately, the city and rural water supplies are not satisfying the demand. A total of 280,000m3 of water is consumed per day but this is only about one third of the daily demand, which totals 763,300m3. The quality of the water supply is also poor. In urban areas, 62-70% of people have access to treated water. In rural areas, treated water is only available to 35-40% of people[27].

Untreated water has resulted in major health concerns in Ghana. Diarrhea for example accounts for about 12% of childhood deaths and it is the third largest cause of death for children under the age of five after malaria and pneumonia. With adequate advancements in the water sector (technology development and adoption), portable water could be made accessible and mortality could drop by as much as 75%. Research has shown that improvement in drinking water quality through household water treatment, such as chlorination at point of use and adequate domestic storage can lead to a reduction of diarrhea episodes by 39% for each $1 invested in safe drinking water and sanitation[28].

Promoted by GoG water and sanitation sector policies and guidelines, private sector participation in water supply markets in Ghana is increasing. Coca Cola Company Limited and agencies with specific interest in water including the Ghana Water Company Limited, Water Resources Commission and the Community Water and Sanitation Agency have formed water strategic partnerships to support growth in the sector. Further, the private sector (particularly

[27]Ghana's Business Development Profile". Danida Business Partnerships. March 2013

[28]Draft National Assessment Report on Achievement of Sustainable Development Goals and Target for Rio+20 Conferences". Ministry of Environment Science and Technology. December, 2011 .

companies engaged in fish processing, fruit processing, and beverage production) are looking to install their own water supply systems because they require large amounts of water which the urban water supply network cannot effectively and reliably deliver[29]. These developments could offer market opportunities for water sector technology and business innovations. Water technologies could include improved purification techniques or infrastructure innovations. Water businesses could include consultancy and contract services, maintenance and private operations of water and sanitation systems, and innovative options for post construction financing, for example the insurance of water facilities, and water supply management.

4.1.5 Climate Smart Agriculture

The main application of this subproject component will be in Agri-Machinery/ Equipment, Food Processing, Bio-Pesticides & Fertilizers, Resilient Crops/Seeds, Agricultural Waste Management.

Background and Opportunities:

Ghana is richly endowed with natural resources that provide a sizable supply of viable agricultural land suitable for forestry, hunting, fishing, crop cultivation, and livestock production. Major local crops in Ghana include cereals such as maize, rice millet, guinea corn and sorghum. Starch foods such as cassava, yam, cocoyam andplantain are also common. Industrial crops include cocoa, cashew, citrus, oil palm, cotton, and rubber. The livestock subsector produces cattle, sheep, goats, and pigs. Popular inland fish species, mainly sourced from the Volta Lake, include tilapia, African perch and bagrus. Floriculture (cultivation of exotic flowers) is a growing industry in Ghana[30].

Both the Ghanaian people and economy are highly dependent on these industries. Approximately 15.7% of Ghana's GDP is derived from the agriculture industry[31] and the livelihoods of most Ghanaians rely on this sector[32].

Despite the vast agricultural production in Ghana, Ghana remains a net food importer, importing over US$500 million of rice alone annually along with large amounts of chicken, meat and other dairy products[33]. Further, only 10,000 hectares of viable, irrigable lands out of a potential of 346,000 hectares is currently being utilized[34]. This excess land and local market demand implies significant opportunity in Ghana for agricultural development across these industries.

To capture this opportunity and promote sector growth, Ghana's agricultural sector must address several challenges. The industry must adapt to the growing threat of climate change. An economic model developed by the World Bank Group estimates that agricultural GDP is to decline by 3 to 8 percent, not expand, by the middle of the 21st century, relative to baseline projections, and indicates that losses in the sector could be as much as $122 million per

[29]"Ghana's Business Development Profile". Danida Business Partnerships. March 2013
[30]"Ghana's Business Development Profile". Danida Business Partnerships. March 2013
[31]As of 2011 http://www.mzz.gov.si/fileadmin/pageuploads/foto/1206/PP_Gana.pdf
[32]World Bank Indicators, 2011
[33]http://ghana.um.dk/en/~/media/Ghana/Documents/DANIDA%20Ghana%20BD%20Profile.ashx
[34]http://www.mzz.gov.si/fileadmin/pageuploads/foto/1206/PP_Gana.pdf

annum.[35] Small-scale farmers and women will be most affected by climate change because they are highly dependent on rain-fed crops for their livelihoods. Small-scale farmers, account for about 80% of domestic production, and women, produce 70% of Ghana's subsistence crops, account for 52% of our labor force and contribute 46% of Ghana's total GDP[36].

Sector modernization will also improve agricultural output. Currently, there exist poor storage facilities for raw materials and processed foods, and a lack of modern processing equipment. In the crop industry, there is limited availability of improved technological packages, especially planting materials and certified seeds by farmers. In the livestock industry, poor management practices (feeding and healthcare) result in low productivity, although the meat processing industry has witnessed significant growth since the 1990s with foreign companies. This modernization must be developed in parallel to education, training and financing schemes. Technical know-how is lacking amongst food processors and there is inadequate funding and commitment to agricultural research.

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In the fishing industry, the major challenge is over fishing, which is leading to a depletion of fish stock. This over fishing is being blamed on the fact there is no policy framework to promote the long-term sustainability of fishing resources. There are also insufficient surveillance and control measures to counteract illegal fishing[37].

There exist several government and private initiatives to address these challenges, open up opportunities and thus strengthen the agricultural industry. Improved agricultural productivity, for example, is a core focus of the Government of Ghana's GSGDA. According to Ghana's policy framework, the main focus of their agricultural development, over the medium-term, will be to accelerate the modernization of agriculture through the implementation of the Food and Agriculture Sector Development Policy (FASDEP II) and the corresponding investment plan as detailed in the Medium-Term Agricultural Sector Investment Plan (METASIP), which will ensure an effective linkage between agriculture and industry[38].

[35]Economics of Adaption to Climate Change". World Bank. 2010

[36]"Netherlands Climate Assistance Program Ghana Country Report". W. Kojo Agyemang-Bonsu, B. Dougherty, A. Fencl, E. Kemp-Benedict". July 2008

[37]Ghana's Business Development Profile". Danida Business Partnerships. March 2013

[38]"Ghana Shared Growth and Development Agenda (GSGDA), 2010-2013 Medium-Term National Development Policy Framework". National Development Planning Commission (NDPC), Government of Ghana. December, 2010

To address the rural populations who might be affected by climate change, the 'Innovative Insurance Products for Adaptation to Climate Change' (IIPAC) project has been developed. The primary goal of this project is to promote income security, food security, credit availability and employment opportunities for Ghana's rural population. The project is designed to enable the insurance sector in Ghana to offer innovative and economically sustainable insurance products against the financial risks caused by extreme weather events and variable temperatures and precipitation. The project began in 2009 and will run until 2013. It received financial support of 2.25M EUR from the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU). It was implemented by GTZ in cooperation with the National Insurance Commission (NIC) and the MoFEP[39].

4.2 Positive Environmental and Social Impacts

The proposed sector activities under the GCIC project supported SMEs will have overall positive environmental and social impacts through accelerated funding and technical support to beneficiary SME activities such as (1) Improved Conservation and Preservation of Water (Sustainable Water Supply, Reduced vulnerability of ecosystem to climatic events) (2) Improved use of Water and domestic waste management (Sustainable water supply through climate technology, Reduced vulnerability of ecosystem to climatic events) (3) Increase Employment (Improved conditions for economic growth through removal of barriers for SMEs, General economic growth through support to beneficiary SMEs and Poverty reduction) (4) Increase access and affordability of renewable energy supply (Increase supply of renewable energy from solar based technologies) (5) Increased sustainable supply of agricultural products (Increase supply of climate smart technologies and products) (6) Greater equity in allocation of water and sanitation (Increased access to basic sanitation, Increased access to water, Reduced rate of water related diseases and Improved health) (7) Improved quality of domestic waste management facilities (Increased access to recycling, Reduced rate of waste related diseases and Improved general environmental and public health).

4.3 Negative environmental and social Impacts and their Mitigation

The implementation of the SMEs' activities and climate technology ventures could result in some limited negative environmental and social impacts, albeit insignificant in magnitude. As the SMEs to be supported by the GCIC program and their locations are not yet known at this stage of reporting, it is difficult to be exhaustive in listing out all the associated potential negative environmental and social impacts and accurately assess the severity of their impacts and risks.

The potential negative environmental and social impacts could arise both during the pre-construction/installation phase and during the construction/installation and operational phases of the funded SME subproject activities.

4.3.1 Pre-Constructional Phase impacts

Pre-Construction/Installation Phase impacts have been identified as comprising the following. Their respective mitigation measures are also presented below.

[39]"Initiatives related to climate change in Ghana towards coordinating efforts". L. Wu rtenberger, I.G. Bunzeck, X. van Tilburg, Energy Research Center of the Netherlands (ECN). April 2011

Site Selection

Sitting of a subproject facilities within a community poses a whole range of problems which impact on project's success and sustainability. Some of the key issues are:

Locating projects near cultural sites such as sacred groves and burial grounds, which could be regarded as insulting and frowned upon or shunned by the people.

Conflict with existing or proposed land use which could create problems of incompatibility

Conflict with nearby communities leading to tension in the use of the facility

Sitting facilities on land where the ownership is disputed

Sufficient land area for facility installation and future expansion

Ecologically sensitive sites such as plains, which liable to flooding, aquifer recharge zone, which may be lost, steep terrain prone to erosion and threat to fragile habitat and endangered species.

Land Acquisition/Involuntary Resettlement

It is not envisaged that the beneficiary SME subproject activities will require large pieces of land for facility installation. As such issues of involuntary resettlement (per the policy requirements of World Bank OP 4.12) resulting from relocation or loss of shelter, loss of assets or access to assets and loss of income sources or means of livelihood are likely to be minimal.

Mitigation

As per the Screening checklist, priority will be given to unencumbered land. However, wherever people are inevitably affected, the dictates of the World Bank OP 4.12 policy on Involuntary Resettlement will be applied. This will ensure that all project-affected persons are appropriately compensated and resettled prior to the commencement of the SME subproject activities.

Community Sensitization, Involvement and Ownership

Not involving communities in subprojects that are benefited by them, usually leads to serious setbacks. If community involvement issues are not handled properly, they could create suspicion, tension and misunderstanding; eventually leading to beneficiaries not fully identifying with the project or in rare cases rejection or sabotage. The major issues to consider with regards to major obstacles to effective project implementation and sustainability are the siting, timing of construction work, and extent and level of involvement of beneficiary communities.

Site Clearing, Preparation and Leveling

Preliminary site preparation involving clearing the site of its top vegetation and removal of top soil, to facilitate the setting out of the layout plan, usually causes erosion particularly in areas

of heavy rainfall and poor drainage, and could potentially reduce rain water percolation into the ground.

Site leveling could interfere with the natural drainage pattern of the area. Storm water run-off could increase. This potential increase in runoffs could enhance erosion, which could cause silting of the natural drainage channel. This in turn could adversely affect the hydrological properties of the area and receiving streams, and could lead to flooding.

Lands at the project sites will be cleared of all vegetation to allow for the facility installation works. This would result in the loss of vegetative cover at the project area and may expose the land to the elements of the weather.

Mitigation

Vegetation clearing will be staggered; it will be done only at sites where construction work is ready to begin. This will limit the exposure of the soil surface to erosion and other factors.

4.3.2 Construction/Installation Phase Impacts

Actual SME subproject facility construction/installation phase impacts will comprise the following:

Air quality impacts (Dust and Exhaust emissions)

Noise generation

Traffic Impacts

Occupational Health and Safety

Public Health and Safety

Solid Waste management

Liquid waste management

These are briefly described below and in Table 4.2 together with their proposed mitigation measures:

Air Quality Impacts

Dust generation from excavation and construction/installation activities could compromise air quality in the project area, especially during the dry season. Exhaust emissions from construction machinery could also affect air quality via their exhaust emissions.

Noise generation

Construction/installation activity could generate noise from machinery and equipment.

Traffic Impacts

Haulage trucks delivering building materials to site could generate traffic impacts by adding to vehicular traffic on roads serving the project area.

Occupational Health and Safety

Construction site workers will be exposed to risks of accidental collisions with moving vehicles, strains from repeated movements or from lifting and heaving of heavy objects, slips and falls, including falls from heights. Accidental cuts from tools and machines are also safety risks. Wet cement as a building material is corrosive on contact to with human skin.

Public Safety

Excavations, pits and heaps of unconsolidated material will be left overnight at the end of a working day at the construction site. These would make the construction site dangerous to stray animals and vagrants who might walk across the site at night.

Solid Waste Generation

Construction activity will generate considerable amount of solid waste, include earth material, wood cut-offs, wood shavings, plastic cut-offs, empty cement sacks, paint cans etc. These would need to be appropriately disposed of.

Liquid Waste Generation

Liquid waste streams will include equipment wash-out after daily construction/installation activity, and human wastes fromworkers.

Table 4.2 below summarizes the identified environmental and social impacts and their proposed mitigation measures at the various phases of the project, assigns roles and responsibilities, and indicates the expected outcomes of the mitigation measures.

4.3.3 Subproject specific Impacts and Mitigation

The five prioritized sector specific areas (see Section 4.1.1- 4.1.5 of this report) and the associated technologies will have additional specific risks and impacts which will also require mitigation as detailed out in Table 4.3 below.

PROJECT ACTIVITY	POTENTIAL ENVIRONMENTAL IMPACTS/ACTIVITY	LOCATION	PROPOSED MITIGATION MEASURE (S)	MONITORING/ FOLLOW-UP	NET EFFECTS	ESTIMATED BUDGET
PRE-CONSTRUCTION PHASE.	Land acquisition Vegetation clearing	Project site	Subproject screening checklist will eliminate and/or minimize issues with resettlement. Selective and staggered vegetation will be done only when construction is ready to begin.	Project Management Team	Eliminate and/or minimize issues with resettlement and displacement. Avoidance of exposure of land surface to erosion	TBD
CONSTRUCTION PHASE	Air quality	Project site and vicinity	Areas to be excavated will be doused with water to minimize dust emissions	Subproject Contractor /SME	Controlled dust generation; Reduced exhaust emissions	TBD

	Noise	Project site and vicinity	Regular maintenance of machinery and equipment. Restriction of construction activity to daylight hours	SME/Subproject Contractor	Reduced noise impacts	
	Traffic impacts	Roads serving immediate project area	Restriction of delivery of materiel to site to off-peak traffic hours. Use of traffic wardens to coordinate traffic flow	SME/Subproject Contractor	Reduced traffic impacts	
	Occupational Health and Safety issues	Project site	Proper site sanitation and housekeeping. Provision and enforced use of PPE. Strict adherence to safety precautions as per Factories, Offices and Shops	SME/Subproject Contractor	Reduced incidence of accidents and injuries.	

			Act, 1970 (Act 328)			
	Public safety	Project site and vicinity	Cordoning off of pits and excavations with physical barriers and appropriate signage.	SME/Subproject Contractor	Reduced risk of accidents and injuries to public	
	Solid waste management	Project site	Excess earthen material will be used in landscaping.	SME/Subproject Contractor	Safe disposal of generated solid waste	
		Project site	Waste skips will be provided to collect wastes for appropriate disposal at municipal disposal site.	"	Safe disposal of generated solid waste	
	Liquid waste management	Project site	Equipment washout will be discharged away from water courses; mobile	SME/Subproject Contractor	Safe disposal of generated liquid waste	

			toilets will be provided for construction workers.			
	Employment and Income		Hired hands will earn some regular income to support themselves and their families.	Project Contractor (SME)	Income generation	
OPERATIONAL PHASE & MAINTENANCE	Operational noise form facility	Project site and environs	Facility to be serviced per requirement of manufacturers manual	SME/Project management team	Less noise pollution on surrounding communities.	TBD
	Solid waste generation	Project site	Waste skips will be provided for waste collection, to be evacuated periodically by waste management contractor to be engaged.	SME/Project management team	Proper sanitary conditions on project compound.	

	Liquid waste generation Security and Safety Run-off management	Project site Project site Project site	Provision and maintenance of on-site liquid waste management facilities Engagement of security personnel to protect subproject facilities Installation of rain gutters to harvest rain into designated receptacles for use in toilets, laboratories.	SME/Project management team SME/Project management team SME/Project management team	Proper sanitary conditions on project compound. Enhanced security on project compound Reduced run-off impacts	

Table 4.2: General Environmental and social impacts and their mitigation

Table 4.3: GCIC Sector Specific Environmental risks and impacts and their mitigation

Area/Sector	Technology	Potential Env/Social Impact	Proposed mitigation measures	Monitoring/follow up	Net effect	Budget
Energy Efficiency (industrial and domestic)	Appliances (e.g. cook stoves, SWH) Transmission and Distribution HVAC Energy Efficient Manufacturing Lighting and Green IT	Generation of e-waste after end of life of these Energy Efficiency products Improper disposal and management (rivers and land) of generated electronic and hazardous waste Potential open burning of end of life e-waste materials leading to poor air quality.	public and corporate take-back and/or recycling services Development of properly engineered landfill for hazardous waste materials. Creation of hazardous waste recycling centers to recycle end of life materials from the industry.	GCIC Management Team/Beneficiary SMEs.	Improved electrical supply due to increase in national supply Overall reduction in GHG emission.	TBD

Area/Sector	Technology	Potential Env/Social Impact	Proposed mitigation measures	Monitoring/follow up	Net effect	Budget
		Leaching of improperly disposed contaminants from hazardous waste into groundwater resources.				
Domestic Waste Management	Recycling, e-waste Management Biogas Generation MW, Distributed Biomass Power kW, Recyclable/ Biodegradable Products, Waste-to-Energy	Poor air quality from odour domestic waste Potential leachate and methane generation from landfilling of domestic waste.	Minimize the quantity of solids generated by the water treatment process. Sludges may require special disposal if the source water contains elevated levels of toxic metals, such as arsenic, radionuclides Use only engineered (liner and capping)	GCIC Management Team/Beneficiary SMEs	Improved electricity power supply Improved domestic waste management	TBD

Area/Sector	Technology	Potential Env/Social Impact	Proposed mitigation measures	Monitoring/follow up	Net effect	Budget
			landfills for hazardous waste disposal. Regenerate activated carbon (e.g. by returning spent carbon to the supplier)			
Renewable Energy	Grid Connected Solar PV Off-grid/Distributed Solar PV Solar Thermal Solar Thin Film Concentrated solar power	Generation of e-waste after end of life of these Energy Efficiency products Improper disposal and management (rivers and land) of generated electronic and hazardous waste Potential open burning of end of	public and corporate take-back and/or recycling services Development of properly engineered landfill for hazardous waste materials. Creation of hazardous waste recycling centers to	GCIC Management Team/Beneficiary SMEs	Improved electrical supply due to increase in national supply Overall reduction in GHG emission	TBD

Area/Sector	Technology	Potential Env/Social Impact	Proposed mitigation measures	Monitoring/follow up	Net effect	Budget
		life e-waste materials leading to poor air quality. Leaching of improperly disposed contaminants from hazardous waste into groundwater resources.	recycle end of life materials from the industry.			
Water Supply Management and Purification	Waste Water Recycling Water Use Efficiency Efficient Irrigation Rain Water Harvesting Portable Water Waste Water Treatment	Potential pollution of surface and ground water though runoff of Pollutants.	Work sites Installed far from waterways Regular collection of work sites wastes for proper disposal	GCIC Management Team/Beneficiary SMEs	Increase in portable water supply Improved waste water management	TBD

Area/Sector	Technology	Potential Env/Social Impact	Proposed mitigation measures	Monitoring/follow up	Net effect	Budget
	Desalination	Water pollution due to seepage from tanks (diesel, sanitary wastes etc) Lack of water for sanitation or toilet facilities Heavy water usage resulting in reduction of surface and groundwater sources	Liquid waste discharged at designated outfalls after effluent treatment to protect water resources Regular emptying of on-site latrines and toilets. Recycle filter backwash into the process if possible. Treat and dispose of reject streams, including brine, consistent with national and local requirements.		Prevention of environmental pollution from improper waste water management.	
Climate Smart -	Agri achinery/Equipment Food Processing	Use of chemical pesticide	Apply integrated pest management techniques.	GCIC Management	Improve livelihood of the rural poor	TBD

Area/Sector	Technology	Potential Env/Social Impact	Proposed mitigation measures	Monitoring/follow up	Net effect	Budget
Sustainable Agriculture	Bio-pesticides and Fertilizers New Resilient Crops/Seeds	Use of dangerous and invasive plant species	Use only environmentally friendly resilient crops/seeds. Project will not fund use of chemical pesticides. Include pesticide use in the project negative list .	Team/Beneficiary SMEs	through cultivation climate resilient crops Increase in food production	

5. ENVIRONMENTAL AND SOCIAL MANAGEMENT IMPLEMENTATION FRAMEWORK

The project will provide risk capital through highly flexible proof of concept and seed funds, and catalyzing joint investment, provide business skill development training for start-up business, among other things. One of the key objectives of the GCIC program is to address the underlying causes of climate change.

The GCIC's main environmental and social impacts will result from the accelerated growth of supported climate technologies which will be undertaken by the beneficiary SMEs. Overall the subproject activities under GCIC will address SMEs and climate technology ventures that have priority climate innovation objectives and are thus expected to have highly positive environmental and social impacts. Some of the positive impacts include (1) Improved Conservation and Preservation of Water (Sustainable Water Supply, Reduced vulnerability of ecosystem to climatic events) (2) Improved use of Water and domestic waste management (Sustainable water supply through climate technology, Reduced vulnerability of ecosystem to climatic events) (3) Increase Employment (Improved conditions for economic growth through removal of barriers for SMEs, General economic growth through support to beneficiary SMEs and Poverty reduction) (4) Increase access and affordability of renewable energy supply (Increase supply of renewable energy from solar based technologies) (5) Increased sustainable supply of agricultural products (Increase supply of climate smart technologies and products) (6) Greater equity in allocation of water and sanitation (Increased access to basic sanitation, Increased access to water, Reduced rate of water related diseases and Improved health) (7) Improved quality of domestic waste management facilities (Increased access to recycling Reduced rate of waste related diseases and Improved general environmental and public health) and increase in employment opportunities.

However there could be potential adverse environmental and social if the designs of the SME subproject activities do not follow good environmental and social practice. Some of the negative environmental and social impacts include the negative environmental impacts may include (i) *air pollution* from both particulate emission sources and dust from construction related works, (ii) *Soil and water pollution* from liquid and solid waste generated as a result of beneficiary SME subproject work activities, (iii) *WEEE* – from waste generation from electrical, electronic, and metallic equipment, which byproducts that would be produced as a result of construction or installation, manufacture or operation of SMEs activities, (iv) Noise from construction/installation and operation of SME subproject works, (v) introduction of invasive plant seedlings or species through climate smart agriculture subproject works, (vi) unsafe occupational health and safety working conditions and (vii) child labor.

The rationale for developing the ESMF is that the exact locations of GCIC supported interventions could not be identified prior to the appraisal of the climate innovation technologies and therefore their potential impacts could not be assessed for actual mitigation measures to be proposed. To ensure that future investments are environmentally and socially sustainable, the ESMF has been prepared to enable future implementers to identify, assess, mitigate and monitor the potential localized adverse environmental and social impacts of future

investments. To address such issues, the approach to the environmental performance and sustainability of the project investments should be based on the process of selection and screening of climate innovation technologies for possible negative environmental and social impacts, and ensuring that appropriate mitigating measures are incorporated in the subproject design as appropriate, in accordance with Ghana's environmental policy and World Bank safeguards policies.

The GCIC will support small and medium enterprises in various sites. The exact sites are not yet known, but will be chosen based on impacts on the economic viability, social and natural environment (air, water and land); human health and safety; and physical resources. Investments are likely to have potential (adverse) environmental risks and social impacts on its area of influence. Therefore, before providing support GCIC should first screen and vet proposal with the aim, to identify positive and adverse potential environmental and social impacts of the proposed business ventures submitted for funding. The selection and design process for business enterprises and income generating climate innovation technology will incorporate provisions, if any, to minimize social tensions and ensure social sustainability. The procedures in the ESMF applicable to SMEs and climate technologies will identify any potential adverse impacts and put appropriate mitigation measures in place prior to subproject implementation. In order to ensure mainstreaming of gender and HIV/AIDs, the training of trainers in gender and HIV/AIDS will be incorporated into the training package related to implementation of climate technology innovations and SMEs.

The ESMF includes training programs, responsibilities for its implementation and monitoring, generic environmental and social management plans and their associated cost of to ensure effective implementation. The necessary procedures and budgets for ensuring enhancement of the environmental performance of the interventions will be incorporated in the proposal for funding. The ESMF reflects clarified roles and institutional responsibilities vis-à-vis the implementation of the safeguard arrangements within it.

5.1 Screening of SMEs subproject activities for potential adverse social and environmental Impacts

Two key components of the ESMF that initiate the process of identification of SMEs subproject potential environmental and social impacts are the (1) Social Impact Screening and (2) Environmental Impact Screening Forms (See Annex 1 & Annex II). These subproject screening forms shall be completed with the relevant site specific information for every investment supported by GCIC, in order to determine the potential adverse environmental and social impacts and to develop appropriate mitigation and monitoring measures in compliance with the Bank's safeguard policies as well as Country environmental legislative requirements.

It will be ensured that the proposal and implementation of the SME activities are socially responsive and environmentally sound. The site specific assessment for their potential impacts is identified during various stages of the subproject activities depending on location, design, construction and operation. Once the need/justification of SME is finalized, the process of environmental and social screening starts. The application of ESMF environmental social screening process will involve the following steps:

Step 1: Environmental and Social Screening

The objective is to assess any potential safeguard issues early in the subproject design and preparation stage. The initial environmental and social screening will be carried out through the use of the Environmental and Social Screening Forms (ESSFs). Completion of the ESSF with information from the actual project sites will be the responsibility of grantee applicants. Based on the ESSF, the Applicant / Grantee will assess any potential safeguard issues early in the preparation process, and describe safeguard issues in the SME fund proposal.

Most of the adverse social and environmental impacts of the SMEs are likely to be site specific. Environmental and social impacts of each SME will vary in their extent, magnitude and duration as per the nature and scale of the SMEs activities and location chosen. In general, the environmental and social screening process identifies what levels of environmental and social assessment are required for the SMEs activity.

The purpose of the screening process is to get potential impacts to be addressed at an early stage and to enable integration of mitigation measures into subproject design at the upstream end of project design. It ensures proper proposal with adequate considerations to mitigate environmental and social impacts. Furthermore, it enhances opportunities for proper costing and budgeting for designed mitigation measures to ensure effective implementation during installation/construction and operational phases of the works.

Consultation with subproject affected persons (beneficiaries/local communities and otherkey stakeholders) through a participatory mechanism plays an important role in identifying the potential adverse impacts of the interventions. The objective of the screening process is to:

Determine and assess the severity of the subproject potential impacts as to whether they are significant and long term or minimal and localized to enable categorization and further assessment.

Determine appropriate mitigation measures and monitoring plan for activities likely to cause adverse impacts during both installation and operational phases;

Incorporate mitigation measures into SMEs proposals before approval for funding and implementation to ensure their effective implementation during installation and operational phases of works;

Screening Steps:

Identification of beneficiary SME subproject activities and possible locations/site

Check if the activity/ location is eligible – reject SME activity if ineligible for funding

If eligible, identify physical environment of the proposed location/site

Identify any relevant features of sites: settlement area, farmers' status, cultural/religious observations in the sites, social characteristics (historically underserved community, women, and vulnerable groups)

Identify any major environmental and social concerns of implementing activities and assess the severity (significant, low) their impacts.

Screening Criteria:

The criteria are developed on the basis of World Bank's safeguard policies and the environmental legislative requirements of Ghana which are:

Degree of impacts on the livelihood systems

Loss of common property resources affecting their livelihood systems

SMEs affecting unemployment,

Activities that require relocation of households, acquisition of lands and other properties

SMEs that promote or involve child labor and

SME that is likely to make adverse impact on women

Pollution risks potential receptors including land, water and air,

Human health and occupational safety etc.

Each SMEs subproject activity will go through an environmental and social screening in order to identify relevant environmental and social impacts prior to approval for funding and subsequent implementation. The outcome of the screenings will inform whether any further investigation and assessment is required to mitigate identified potential impacts.

All SMEs subproject activities that have significant potential environmental and social impacts will not be supported without an appropriate further assessment to mitigate the identified impacts and risks. On the other hand, all SME subproject activities that are likely to have minimal or no adverse environmental and social impacts will require no further environmental and social impacts beyond the initial environmental and social subproject screening process.

Step 2: Assignment of the Appropriate Environmental Category

The environmental assessment (EA) category of a sub-project will be defined during the screening process. Sub-projects are categorized (A, B, C, FI) according to the screening procedure (World Bank Operational Policy (OP) 4.01) and depending on the type, location, sensitivity, scale of the project activities, nature and the magnitude of its potential environmental and social impacts. The Ghana EPA's EIA screening procedure has a similar categorization process as well and will be followed by all beneficiary SMEs prior to registration of the subproject activities.

The information gathered during completion of the ESSF must be evaluated by relevant authorities to determine which impact category best fits a given project activity in compliance

with the Bank's safeguard policies and the Ghana Environmental Impact Assessment procedure.

All sub-projects activities with minimal and localized potential environmental and social impacts few if any of the impacts are irreversible, and they can easily be mitigated, will be categorized as "B".

If the screening form has only "No" entries, the sub-project will be a "C" and will not require further environmental work. If there are any "Yes" entries, the sub-project will be a "B" and will require further assessment prior to implementation.

The overall GCIC project is classified as category B and therefore only category B and C sub-projects are eligible for financing. All subproject screening outcomes resulting in Category A shall be excluded from financing and as such no Category A subproject will be funded under the GCIC.

Assignment of the appropriate environmental category following the outcome of the subproject screening process will be the responsibility of the GCIC management team and the officer tasked with ensuring the effective implementation of the projects safeguard arrangements.

Below are the brief definitions of the environmental categorization and an outline of the associated further assessment required to comply with both World Bank and Country environmental legislative requirements:

Category A: A proposed project is classified as Category A if it is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works. EA for a Category A project examines the project's potential negative and positive environmental impacts, compares them with those of feasible alternatives (including the "without project" situation), and recommends any measures needed to prevent, minimize, mitigate or compensate for adverse impacts and improve environmental performance. For a Category A project, the borrower is responsible for preparing a report, normally an EIA (or a suitably comprehensive or sectoral EA) that includes as necessary, elements such as environmental audits or hazard or risk assessments.

*** Note: It must be noted that sub-projects assigned the environmental category A will have to be either redesigned and rescreened or dropped because the parent project GCIC has been assigned the environmental category B. Therefore, category A subprojects cannot be funded under GCIC.**

Category B: A proposed project is classified as Category B if its potential adverse environmental impacts on human populations or environmentally important areas – including wetlands, forests, grasslands, and other natural habitats - are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigatory measures can be designed more readily than for Category A projects. The

scope of EA for a Category B project may vary from project to project, but it is narrower than that of Category A. Like Category A, it examines the project's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance.

Category C: A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental impacts. Beyond screening, no further EA action is required for a Category C project.

Step 3: Carrying out the Appropriate Level of Further Environmental Assessment

A risk based tiered approach will be adopted in the further assessment of all SMEs activities with significant or high potential impacts. The outcome of the subproject screening process will inform the level of detailed further assessment in order to develop effective mitigation measures to address the identified potential impacts. It is anticipated that most of the beneficiary SMEs activities supported by the GCIC are likely to have minimal or no adverse environmental and social impacts. Hence, beyond screening, no further environmental assessment is required.

In cases where the outcome of the subproject screening process indicates potential significant environmental and social impacts and risks, further assessment by way of an Environmental and Social Impact Assessments (ESIA) inclusive of an EMSP or a project specific Environmental and Social Management Plan (ESMP) may have to be prepared, publicly consulted on and disclosed prior to project implementation.

Step 4: Stakeholders Consultations and Disclosure

Stakeholder consultations have been carried out before and during the preparation of the ESMF and the consultation output has been incorporated into the ESMF. Additional consultations will be made with project affected people and other key stakeholder groups during identification of SMEs in the course of the environmental and social screening process, and the results will be incorporated into the proposal to be submitted for funding.

Step 5: Review and Clearance

The applicant's proposal will be reviewed by GCIC staff to validate proper consideration of environmental and social concerns as per the safeguard arrangement within the ESMF. The proposal will be approved for funding on the condition that its adverse environmental and social impacts are minimal, negligible, reversible, and insignificant and can easily and cost-effectively be mitigated.

Step 6: Environmental Monitoring

An Environmental monitoring process assesses the performance of project designed mitigation measures through scheduled and routine (annual reports, midterm reviews etc.) monitoring and evaluation programme. The environmental monitoring program for GCIC will include key performance indicators to monitor performance of the ESMPs. It will enable gaps and weaknesses within an existing ESMP under implementation to be identified for further assessment and amendment as well as sustaining of well performing mitigating measures. Indicators such as how may subproject screening forms have been completed, how many dust and noise complaints have been made by project affected persons, how many ESIAs and ESMPs have been developed, will be included in the subproject identification and preparation stages to enable reporting. The GCIC management team will have the sole responsibility for the environmental and social monitoring function of the project. The M&E specialist within the management team shall be tasked to include the key performance indicators relating to the E&S performance into the main monitoring schedules for the project.

5.2 Guidelines of the Role of the EPA in the Project

For individual projects, the EPA will implement monitoring programs on project-by-project basis once the site specific assessment is considered satisfactory. The level of assessment for any individual project would depend on the following factors; (i) Size or scale of project, (ii) nature/type and magnitude of impacts, (iii) location (land use consideration, compatibility and sensitivity),(iv) resource base and (v) resource at risk.

In general, there are three environmental assessments available under the Ghana EIA procedures. These are:

5.2.1 Individual Projects for which only Registration Assessment may be required

Registration Assessment (RA) is based on information provided in completing Form EA1, which is the starting point in Ghana's EIA procedures. The appropriate EPA Regional office would receive a duly completed EA registration form EA1 and Environmental Assessment Checklist, in duplicate, in respect of the particular project to be developed. The EPA officers would visit the proposed projects sites to assess the adequacy of the information provided and also the appropriateness/ suitability of the selected site, among others criteria.

5.2.2 Individual Projects for which Preliminary Environmental Assessment may be required

Preliminary Environmental Assessment– a less detailed form of EIA, this leads to a Preliminary Environmental Report (PER). The Terms of Reference (TOR) are determined by the EPA after the Registration Assessment (RA). If there is the need for further analysis, after the appropriate RA, the relevant EPA Regional office would advise on the scope of the Preliminary EA to cover the development. The officers would assist by assessing the adequacy of information provided and the suitability of proposed mitigation actions in the PER.

5.2.3 Individual Projects for which Environmental Impact Assessment may be required.

Environmental Impact Assessment (EIA)– detailed study based on an initial scoping report and carried out on the TOR agreed with the EPA. These are sub-projects, which may be located in

environmentally sensitive or critical areas. It has been found from the site screening check list that the micro natures of the proposed Ghana SEIP components are such that full scale EIA may not be necessary. However, certain water projects (e.g. boreholes) have potential for environmental sensitivity, and it is important that greater attention is paid to siting them. Finally, the EPA would assist, monitor, and ensure that the DEOC complies with laid down EIA procedures in the implementation of the individual projects, especially when it comes to site selection and the issue of Compensation and Resettlement.

5.3 Guidelines for EPA's Registration of the Projects

The EPA Regional Offices will register all GCIC site specific subproject activities located in their respective regions and monitor environmental compliance following implementation. EPA Head office would also maintain a register of all GCIC site specific activities and prompt the regional officers to monitor the projects and provide updated information on their performance and status.

5.4 Monitoring of Potential Impacts

The monitoring of environmental effects is necessary to ensure that predicated impacts are addressed effectively and efficiently through the mitigating measures indicated. The three main objectives of the monitoring exercises are:

To ensure that the proposed mitigating actions are appropriate for addressing the identified impact.

To ensure that any additional impacts not identified in the analysis of the potential environmental and social impacts of the rehabilitation and/ or construction of school buildings, etc. and provision of water points and sanitation facilities are captured as early as possible.

To ensure feedback information to the Ministry of Education and the EPA in order that appropriate modifications can be made to either the operational activities or to the environmental management plan in terms of mitigating measures to be applied.

6. IMPLEMENTATION, SUPERVISION AND MONITORING

6.1 Implementation and Process Monitoring

The GCIC will be hosted in Ashesi University which will be the main project coordinating/ implementing Unit for the GCIC. Ashesi will be assisted by an implementing consortium consisting of (i) Ernst and Young Ghana, (ii) SNV Netherlands Development Organization, and (iii) United Nations University Institute for Natural Resources in Africa (UNU-INRA). Ashesi and its associated consortium partners will be responsible for all aspects of the GCIC establishment and operations including securing appropriate facilities, identifying a world-class management team, providing the services and programs described in the business plan, and ensuring effective monitoring and evaluation (M&E) of programs. Ashesi will also report to infoDev and the infoDev Climate Innovation Multi-donor Trust Fund (CITF) Steering Committee to ensure effective and successful execution of the program in accordance with required fiduciary and financial management practices.

6.2 Organizational Structure

The GCIC will have its own internal organizational structure which will comprise of an advisory committee, a management team and key staff.

6.2.1 Advisory Committee (AC):

An Advisory Committee will advise the GCIC host Ashesi, on technical elements related to planning, strategy and business development. It will include up to 5 members, to be composed of relevant private sector and government representation and will be nominated by the GCIC in collaboration with *info*Dev and founding partners.

The memberships of the AC will be provided on a two-year rotating basis and will assist in forming linkages with various public and private partners to help achieve its mandate. The GCIC will consult *info*Dev and other funding partners on changes in the committee's structure over the duration of the program. The AC, once established, may organize separate bodies that, can advise on specialties based on technology sectors. For example, the GCIC may have an advisory sub-committee on 'waste management technologies'.

6.2.2 Management Team

In accordance with the organizational design, program budgets will be managed by a management team led by the GCIC CEO. The CEO will be responsible for the day-to-day operations of the Center, including oversight of programs, reporting to infoDev, the host Ashesi and advisory committee, developing relationships, setting strategic objectives and fund-raising. The GCIC CEO will be supported by a Senior Marketing and Communications Officer that will lead the promotion, branding and dissemination of the Center's programs and services. The CEO will also be supported directly by Procurement and Financial Management Specialists to ensure appropriate fiduciary duties are enacted and procurement guidelines followed and a Monitoring and Evaluation Specialist to build and implement the M&E framework and systems.

6.2.3 GCIC Staff

Other roles within the GCIC include an Access to Finance Manager who will manage the budgets for the POC grants and the investment facilitation activities. Other Managers will

manage the budgets for the Entrepreneurship, Technology Development and Market Growth and Access service lines. Business Advisors will handle advisory work to CIC clients, with additional Advisors added as the CIC takes on more clients. A Policy Fellow will lead the policy advocacy and other related analytical products while a Gender and Rights Specialist will have the critical role of ensuring that the Center's Women Entrepreneurship program and Rights focus is mainstreamed, monitored, evaluated and directed throughout the CIC's operations.

6.3 Implementation of Environmental and Social Management Framework

The implementation arrangements for the ESMF will be integrated into the proposed governance and management structure of GCIC to ensure sustainability and development of capacity which can be sustained after the initial funding assistance phase of the project. Therefore the management team of the GCIC will take overall responsibility for the implementation of the environmental and social management arrangements within the ESMF to ensure compliance with Bank and Country environmental policy and legislative requirements.

6.3.1 Screening of Environmental and Social Impacts

The GCIC Management team will ensure that all beneficiary SMEs subprojects are screened using the screening checklist forms (See Annex I & II of this ESMF) to identify any potential environmental and social impacts associated with the SME subproject work activities. For those subproject activities that warrant further assessment following the outcome of the initial screening, the management team will further ensure that such assessments (ESIA, ESMPs, (a)RAPs etc.) are undertaken by the SME in compliance with all relevant environmental policy and legislative requirements prior to subproject approval and implementation.

Registration and permitting requirements of the Environmental Protection Agency (EPA) shall be met for all applicable SMEs subproject works in compliance with the EPAs EIA requirements

Management will also ensure that appropriate budgetary allocations for implementing any designed ESMPs are considered prior to subproject approval to ensure their effective implementation during the operational phase of the subproject.

6.3.2 Disclosure and Consultation

Consultations with key stakeholders and project affected persons play a major role in identifying the potential impacts of any proposed transmission system project. Community consultations assist in the identification of socio-economic, religious and cultural impacts.

The GCIC management team will also ensure that subproject activities affected persons and key other stakeholders are consulted on and all relevant information that will ensure effective consultation are made readily available to them. List of attendees to any such consultation meeting and concerns raised by the project affected persons shall be logged and factored in the subproject design to minimize potential environmental and social impacts.

6.3.3 Environmental Monitoring

Environmental and social monitoring needs to be carried out during implementation of business ventures; in order to measure the success of the mitigation measures being implemented.

Monitoring will be conducted to check effective implementation of the designed ESMPs by SMEs and to provide timely information about the success, or otherwise of the changes to be made, if required.

The requirements of the ESMF will be implemented by private entrepreneurs who will receive grants under the GCIC project. The GCIC management team will also monitor and document the implementation of safeguard measures during implementation. The GCIC management team will coordinate the overall ESMF implementation of mitigation plans in cooperation with the Environmental Protection Agency and any other relevant government agency. The GCIC management team will facilitate all the processes to complete the screening, implementation, monitoring & compliance, coordinate with the beneficiaries in information sharing and managing the environmental and social issues; collaborate with line agencies of government and non-government working in social and environmental management and coordinate/collaborate with the key agencies, such as Municipality and metropolitan district assembles environmental protection offices and others for all the necessary screening and assessment in order to address any potential adverse social & environmental risks and ; carry out environmental compliance review; manage environmental and social awareness and orientation activities; provide orientation and training to the business entrepreneurs and all relevant and concerned government agencies on the management of social and environmental impacts.

6.4 Results Monitoring

The results monitoring plan has two components: (i) monitoring of the compliance and effectiveness of the ESMP and other safeguard arrangements within the ESMF and application of the recommended standards; (ii) impact monitoring, i.e., measuring the socio-economic impacts of the business venture. Key performance indicators to check compliance and effectiveness of the ESMPs will be included into the scheduled/routine (annual reports, Midterm reviews etc.) and ad hoc monitoring and reporting schedules for all the beneficiary SMEs subproject works.

The M&E officer/section of the GCIC management team will monitor and provide the necessary feedback information to assess the performance of the environmental and social key performance indicators. This result monitoring will enable gaps and weaknesses within this proposed safeguard arrangements to be identified for attention and good practices to be promoted by upscaling to other relevant beneficiary SMEs.

6.4.1 Monitoring plan

The objective of the monitoring plan is to establish appropriate criteria to verify the predicted impact of the project, and to ensure that any unforeseen impacts are detected and the mitigation measures adjusted where needed at an early stage.

The plan will ensure that mitigating measures are implemented throughout the life cycle of subproject activity implementation.

Specific objectives of the monitoring plan are to:

Check the effectiveness of recommended mitigation measures;

Demonstrate that sub-project activities are carried out in accordance with the prescribed mitigation measures and existing regulatory procedures; and

Provide early warning signals whenever an impact indicator approaches a critical level.

Oversight for the environmental and social management process of the sub-projects will be assured by the GCIC management team (via the M&E specialist and Rights and Gender Specialist).

Monitoring will be conducted during all phases of the project. The M&E specialist will prepare a long term monitoring strategy that will encompass clear and definitive parameters to be monitored for each sub-project. The monitoring plan will take into consideration the scope of subproject activities/works, the environmental and social sensitivity and the financial and technical means available for monitoring. The plan will identify and describe the indicators to be used, the frequency of monitoring and the standard (baseline) against which the indicators will be measured for compliance with the ESMP.

A number of indicators would be used in order to determine the impact of the GCIC Project with respect to increased employment, improved use of water and sanitation, climate smart agriculture, solar energy sources, greater equity in allocation of water and increased affordability reduction in waterborne diseases etc. Key monitoring indicators to measure these outcomes or results are presented in the Table 6.1

Other considerations to determine the status of the affected environment are as follows:

Has the pre-project human and natural environmental state been maintained or improved through the provision of the sanitation and water facilities and;

Has the effectiveness of the ESMF technical assistance, review, approval and monitoring process been adequate to pre-empt and correct negative impacts inherent in certain types subproject works?

Environmental Indicators: Loss of vegetation; Land degradation; Compliance with Legislations.

Table 6.1: Results and Monitoring Indicators

Results/Outcome	Indicators
ESMF compliance check	No of subproject screened
	No of subprojects registered with the EPA
	No of subprojects requiring PER/EIA
Domestic Access to safe drinking water	No of improved water service providers since project inception
Climate smart Agriculture	No of farmers using climate smart technologies
Employment	No of employment created following implementation of SME subproject activities

7. ESMF IMPLEMENTATON AND CAPACITY BUILDING PLAN

At this early stage of project preparation, it is not feasible to assess capacity of the entire individual beneficiary SMEs during preparation of this ESMF because the list of all beneficiary SMEs and the specific details of their subproject works activities have not been finalized. However it is assumed that most of the beneficiary SMEs will have little or no prior experience or capacity to effectively implement the safeguard arrangements within the ESMF and as such will require some form of introductory training sensitize them about their roles in the overall safeguard implementation arrangements process.

The host of the GCIC Ashesi has experience with implementing similar World Bank (IFC) safeguard policies in the past and as such has developed the capacity to provide the necessary guidance needed for the GCIC project. The staffing plan for the GCIC management team will include an M&E specialist and a Rights and Gender Specialist both of which will play key roles in the implementation of the safeguard arrangements for the project. It is therefore highly recommended that such key staff (M&E specialist and Rights and Gender Specialist) should be trained through a 'train the trainer' programme for them to cascade the knowledge and information subsequently to the beneficiary SMEs as and when they are engaged for support under the GCIC project. The capacity building training will be given in the following areas namely;

- Environmental and social impact screening process using ESMF checklists

Screening process

Assignment of environmental categories

Rationale for using Environmental and Social Checklists

The importance of public consultations and participation of households in the screening and planning process

How to monitor ESMF implementation

- Safeguard policies, procedures and sectorial guidelines

Review and discussion of Ghana's environmental policies, procedures, and legislation

Review and discussion of the Bank's safeguard policies

- Selected topics on environmental protection and social safeguards

Air, water and soil pollution

Health and Safety

Waste management and disposal

HIV/AIDS etc

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7.1 ESMF Implementation schedule

The implementation schedule of the environmental and social safeguard arrangements within the ESMF are detailed in the Table 7.1 below;

Measures	Proposed Actions		Implementation Period in the project Cycle
Mitigation Measures	View list of mitigation measures (See Table 4.2)		During subproject implementation
Administrative Measures	Recruitment of the management team of the GCIC		Before subproject approval and implementation
Technical Measures	Preparation of the ESIA/ESMPs for all relevant SME subproject activities		Following screening of subproject activities of all beneficiary SMEs.
Training of Beneficiary SMEs	Training of ESMF implementing actors (GCIC management team and identified beneficiary SMEs) in environmental and social assessment		1st quarter First project year
Follow up Actions	GCIC environmental monitoring	Close monitoring	During the implementation of the GCIC project
		Supervision monitoring	Monthly or as deemed appropriate
	ESMF/ESMP Evaluation		At Mid-term
			End of the GCIC Project.

7.2 Cost of Capacity Building and Implementation of the ESMF

The proposed budget shown below for capacity building, training and implementation of the ESMF and mitigation measures is prepared taking into account expert estimates for the environmental and social/safeguard activities for the project. The budget stands open for revision and improvement as and when needed by the GCIC especially following any significant changes (inflation, fluctuations in currency exchange rates, changes in staff plan and scope of subproject activities) that warrants review of the costs.

The ESMF implementation involves three broad categories of costs:

Training and capacity building costs; and

External monitoring costs;

Information and Communication costs

The estimated cost of the GCIC ESMF implementation for duration of five years is about GHS 220, 281.96 (approx. US$69,000[40]). The detailed budget is explained in the following table:

Table 7.2: Estimated budget for capacity building & for implementation of the ESMF

	List of Activities	Unit Costs $ US					Total Cost ($US)
		Year 1	Year 2	Year 3	Year 4	Year 5	
1.	Training & Awareness Creation on ESMF						
1.1.	Training and sensitization of Management team of GCIC for about (10) people	4000	-	-	-	-	$4000
1.2.	Training and Sensitization of beneficiary SMEs on safeguard due diligence and arrangements (40 people)	8000	10000	10000	10000	10000	$48,000
1.3	Training and Awareness creation for other key staff such as from the EPA (4)	2000	-	-	-	-	$2000
2.	Monitoring Costs for quarterly monitoring of performance indicators for 5 days	3000	3000	3000	3000	3000	$15,000
3.	Follow up actions after screening of beneficiary subproject activities	TBD[41]	TBD	TBD	TBD	TBD	TBD
	TOTAL (Annual)	17000	13000	13000	13000	13000	$69,000.00

[40] These estimates are based on current market rates for the proposed safeguard activities and are subject to change due to inflation and currency exchange rate fluctuations.

[41] Final cost estimate will be informed by the outcome of the subproject activities screening assessment

Annex I. Small and Medium EnterpriseSocial Screening Form (SSF)

The Social Screening Form (SSF) has been designed to assist screen of SMEs for any potential adverse social & environmental before funding them. The form is designed to place information in the hands of implementers and reviewers so that impacts and their mitigation measures are determined.

The Form contains information that will allow reviewers to determine the characterization of the prevailing local bio-physical and social environment with the aim to assess the potential social negative impacts of the technology investment.

1.Name of the SME ----------

2. Location of the SME ----------

3. Applicant Name----------

4. Contact details of the person responsible for filling out this SSF:

Name: ……..

Job title:……

Telephone numbers:……; ……..

Signature: ……

PART A: Brief Description of Small and Medium Enterprise Activities

Please provide information on the type and scale of the climate change innovative technology (area, required land, approximate size of total building floor area, roads, disposal sites, water supply, energy requirement, human resources, etc.).

PART B: SOCIAL SAFEGUARDS SCREENING FORM

	Social safeguards screening information	Yes	No
1	Will the sub project activities reduce other people's access to their economic resources, like land, pasture, water, public services or other resources that they depend on?		
2	Will the project result in resettlement of individuals or families or require the acquisition of land (public or private, temporarily or permanently) for its development? Note: Sub-projects that lead to new land acquisition or loss of livelihood and assets are excluded from financing under this project.		
3	Will the project result in the temporary or permanent loss of crops, fruit trees and household infra-structure (such as granaries, outside toilets and kitchens, etc.)?		
4	Will the project require excavation near any historical, archaeological or cultural heritage site?		
5	Might the project adversely affect vulnerable, hard to reach people and underserved groups (e.g., elderly poor pensioners, physically challenged, women, particularly head of households or widows, etc.) living in the area?		
For all issues indicated by "Yes", the applicant is expected to explain how he/she intends to mitigate them. If it is not possible, the climate change innovative technology will not be financed.			

Annex II. Small and Medium Enterprise Environmental Screening Form (ESF)

PART A: IDENTIFICATION

1.Name of the SME ----------

2. Location of SME business:-Region---------City---------- ------

3. Applicant name or SME entrepreneur: ----------

4. Contact details of the person responsible for filling out this ESF:

Name: ……..

Job title:……

Telephone numbers:……; ……..

Fax Number: ……..……..

E-mail address: ……..……..

Date: ……

Signature: ……

PART B: BRIEF DESCRIPTION OF SUB – PROJECT Activities

Describe the sub-project location, siting; surroundings (include a map, even a sketch map).Please provide information on the type and scale of the sub-project (area, required land, approximate size of total building floor area, etc.).

PART C:Brief description of the environmental situation and identificationof environmental impacts

1. Will the business venture:

- Encroach onto an important natural habitat? Yes------- No----------.
  If yes, what are the mitigation measures? ----------

- Negatively affect ecologically sensitive ecosystems? Yes------- No----------.
  If yes, what are the possible mitigation measures?----------
  ----

1. **Will this SME activity involve or introduce pesticides?** Yes---------No--------

If Yes, suggest mitigation measures ----------

---

3. Will this result in:

- Diversion or use of surface waters? Yes--------No ----------
- Production of waste (e.g. slaughterhouse waste)? Yes ----------No----------
- New or rebuilt irrigation or drainage systems? Yes-----No----------

If Yes, describe suitable measures for managing the potential adverse environmental effects of these activities.----------
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4. Will the SME activity:

- Acquire land? Yes ---------- No ----------If yes, does this affect an individual or the community's access to land or available resources? Yes---------- No ----------
---
- Displace or result in the involuntary resettlement of an individual or family? Yes------ or No --------- If Yes, tick one of the following boxes**:**

  - Land is acquired voluntarily and evidence is attached in subproject is adequate. No further action required.
  - Land received involuntarily. The application cannot be considered.

5. Public Health

(a) Is there any concern about **HIV/AIDS** related to the activities?

Yes _____ No _____

If yes, please indicate efforts on how HIV/AIDS issues should be addressed.

---

6. Rivers and Lakes Ecology

(a) Is there a possibility that, due to construction and operation of SME, the river and lake ecology will be adversely affected? Attention should be paid to water quality and quantity; the nature, productivity and variations of these over time.Yes_____ No _____If yes, please describe the current state of these water management structures.----------
---
---

7. Geology and Soils

Are there areas of possible geologic or soil instability (prone to: soil erosion, landslide, subsidence, earthquake etc.)?Yes _____ No _____

Are there areas that have risks of large scale increase in soil salinity? Yes ___ No _____

Are there areas prone to floods, poorly drained, low-lying, or in a depression or block run-off water? Yes _____ No _____

8. Contamination and Pollution Hazards

Is there a possibility that the sub-project will be at risk of contamination and pollution hazards (from latrines, dumpsites, industrial discharges, etc.)?Yes _____ No _____

9. Blocking of Access and Routes or Disruption of normal Operations in the General Area

Will the sub-project interfere or block access, routes, etc. (for people, livestock and wildlife) or traffic routing and flows? Yes _____ No _____

10. Noise and Dust Pollution during Construction and Operations.

Will the operating noise level exceed the allowable noise limits? Yes _____ No _____

Will the operation result in emission of copious amounts of dust, hazardous fumes?

Yes _____ No _____

11. Degradation and/or Depletion of Resources during Construction and Operation

Will the operation involve the use of considerable amounts of natural resources such as sand, wood, stones (construction materials, water spillage, land, energy from biomass, etc.) or may lead to their depletion or degradation at points of source?

Yes _____ No _____

12. Solid and Liquid Wastes

Will the operation of SME generates solid and/or liquid wastes (including human excreta/sewage)?

Yes _____ No _____If Yes, does the sub-project include a plan for their adequate collection and disposal? Yes _____ No _____

As regards safe waste management, does the SMEs have waste management plan to guide it in the selection and implementation of appropriate disposal methods? Yes _____ No_____. If yes, who will be responsible for integrating its provisions for waste management into the sub-project? Please describe._____
_____
____

13. Occupational Health Hazards

Will the SME require large number of staff? Yes _____ No _____ Are the SME activities prone to hazards, risks and could result in accidents and injuries to workers during construction or operation?

Yes _____ No _____

14. Public Consultation

Has stakeholder consultation, participation and prior and informed consent been sought?

Yes _____ No _____

Describe the consultation process that has taken place and list the outcomes and recommendations made by the participants.----------

PART D: MITIGATION MEASURES

For all "Yes" responses, describe briefly the measures taken/proposed to this effect with the necessary budget-cost estimates.

Recommendations:

☐ Requires an EIA and/or RAP, to be submitted on date:
☐ Requires ESMP, to be submitted on date:.
☐ Does not require further environmental studies

Reviewer :
Name: _____
Signature: _____
Date: _____

Annex III Consultations with key Stakeholders

The various institutions, organizations, Ministries, Departments and Agencies, individuals and stakeholders that were consulted consulted include the following;

Beneficiary SMEs

Over 70 SMEs have been consulted as part of the infoDev's study to identify priority sectors areas for assistance under the GCIC project. SMEs will play key role (primary project implementers) in the overall sustainable implementation of the GCICs subproject activities. Positive responses have been shown by the identified SMEs and other key stakeholders.

Environmental Protection Agency

The EPA plays a lead role in the administration of EIA in Ghana. The EPA Act (Act490, 1994) mandates the Agency to ensure compliance with laid down EIA procedures provided comprehensively for site-specific project impact assessment. The GCIC Project in its preparatory assessment is to be considered under the Environmental and Social Management Framework (ESMF).

It is intended that a single Environmental Approval would be issued for the GCIC, on the basis of this ESMF by the EPA. For individual projects, the EPA will implement monitoring programs on project-by-project basis once the site-specific assessment is considered satisfactory. The level of assessment for any individual project would depend on the following factors.

- Size or scale of project
- nature/type and magnitude of impacts
- location(land use consideration, compatibility and sensitivity)
- resource base and resource at risk

The EPA has environmental assessment and management capacity. The Agency has offices in all the 10 regions of the country, staffed with highly qualified personnel.

The Ministry of Local Government and Rural Development

This Ministry was contacted on the role the District and Municipal Assemblies are playing in the environmental management. The municipal assemblies are responsible for waste management. Similarly, the DAs are responsible for waste disposal and some water and sanitation management in the Districts.

Town and Country Planning

The Town and Country Planning in districts would scrutinize and approve, or otherwise any building or major infrastructure plans and would provide a Zoning Report. The Plans and the Zoning Report are to be attached to the Form EA1 and submitted to EPA.

The Town and Country Planning Department has limited environmental assessment and management capacity.

Metropolitan Authorities & District Assemblies

Ghana has a system of local government and an administration, which is as far as practicable decentralized. The District Assemblies and Metropolitan Authorities are the highest political authorities in the districts and they have the deliberative, legislative and executive powers. The functions of these local authorities include the formulation and execution of plans, programs and strategies for the effective mobilization of resources necessary for the overall development of the districts.

More importantly, the management and final disposal of wastes at landfill sites or into sewerage systems is the responsibility of the district and the metropolitan assemblies. The concerns of some of the District and Metropolitan Assemblies have been sought and factored into this document.

District Environmental Management Committees (DEMC)

The above committees are directly responsible for environmental issues in the district. They have direct oversight responsibility concerning issues of water and sanitation. They play a key role in terms of organization for cleanliness within the district. Their opinion in the GCIC project and its possible facilities within the community is very paramount, as it would go a long way to ensure project sustainability. Members' of the DEMC have had some training in Environmental Management.

Community Water and Sanitation Agency

The Community Water and Sanitation Agency is a semi-autonomous agency established by Act 564 of 1998 with its own Board of Directors.

As a main agency for local level development within the governmental machinery the DAs are to work through District Water and Sanitation teams to establish district water and sanitation programs and promote the project ineligible communities. The DAs will open separate accounts and contribute a certain percentage of funds to the cost of facilities demanded by the communities within their area of operation. The agency's roles among other thing are to:

- Preparation and review of annual district water and supply and sanitation plans
- Promotion and dissemination of information on Community and water
- Sanitation Projects and arouse the interest of the Communities
- Identification of interested communities and prioritization of communities and based upon established criteria
- Ensuring all members of the community, especially women actively participate in decision making

The CWSA has responsibility for facilitating the animation, construction and operation of water and sanitation facilities.

The figures below are pictures of some of the consultation process captured during both the project preparation and ESMF development.

Annex IV. Terms of reference for an Environmental Consultant

How this role and position will fit into the GCIC's administrative structure is yet to be determined. This TOR describes the essential tasks required to support the environmental and social screening, review, appraisal and monitoring requirements for all the subproject works proposed under the project.

The Advisor/Consultant will support the overall ESMF environmental and social due diligence with:

- Development of all background information related to E&S application requirements for submission to EPA
- ensuring that the applications are screened and reviewed using the E&S Checklist and Screening Forms
- the preparation of each ESS Form, EPA Form 1, EPA Permit requirements and any other documentation required prior subproject approval.
- discussions with all relevant government agencies (e.g. District Assembly officials) and integration with authorized engineers and other specialist supervisory contractors for the successful implementation of the subproject activities.
- technical advice, on an as needed basis to GCIC and beneficiary SMEs and their representatives on E&S provisions and the requirements for final due diligence reports.
- monitoring SMEs subproject activities as it relates to adherence with the E&S requirements and associated guidelines,
- resolving implementation bottlenecks, and ensuring overall that E&S requirements proceeds smoothly;
- conducting the annual E&S audit for all completed beneficiary SME subproject works
- collecting and managing E&S information relevant to the implementing authorities (i.e. environmental monitoring and audit reports); and
- Develop the annual E&S status report for the GCIC project.
- Liaise with relevant government agencies to share knowledge and explain the objectives and E&S requirements of the GCIC project.
- Lead the delivery of capacity building programmes for all interested stakeholders

The Advisor/Consultant will be retained on a full or part time basis pending as required by the needs of the GCIC.

Annex V: Example of environmental contract clauses

Proper environmental management of minor construction/installation subproject works of GCIC can be achieved only with adequate site selection and project design. As such, the EA for projects involving any installation and minor construction related works should provide information as to screening criteria for site selection and design including the following:

Site selection

Sites should be chosen based on minimal E&S impacts from the projects, with specific lots chosen based on geographic and topographic characteristics. The site selection process involves site visits and studies to analyze: (i) the site's urban, suburban, or rural characteristics; (ii) national, state, or municipal regulations affecting the proposed lot; (iii) accessibility and distance from inhabited areas; (iv) land ownership, including verification of absence of squatters and/or other potential legal problems with land acquisition; (v) determination of site vulnerability to natural hazards, (i.e. intensity and frequency of floods, earthquakes, landslides, hurricanes, volcanic eruptions); (vi) suitability of soils and subsoils for construction; (vii) site contamination by lead or other pollutants; (viii) flora and fauna characteristics; (ix) presence or absence of natural habitats (as defined by OP 4.04) and/or ecologically important habitats on site or in vicinity (e.g. forests, wetlands, coral reefs, rare or endangered species); and (ix) historic and community characteristics.

Project design

Project design criteria include, but are not limited to, the consideration of aspects such as heating, ventilation, natural and artificial light energy efficiency, adequate water supply and sanitation systems, historical and cultural considerations, security and handicapped access.

Installation and minor Construction activities and environmental rules for contractors

The following information is intended solely as broad guidance to be used in conjunction with local and national regulations. Based on this information, environmental rules for contractors should be developed for each subproject, taking into account the project size, site characteristics, and location (rural vs urban).

After choosing an appropriate site and design, subproject activities can proceed. As these installation and minor construction activities could cause significant impacts on and nuisances to surrounding areas, careful planning of the activities is critical. Therefore the following rules (including specific prohibitions and construction management measures) should be incorporated into all relevant bidding documents, contracts, and work orders.

Prohibitions

The following activities are prohibited on or near the project site:

- Cutting of trees for any reason outside the approved construction area;
- Hunting, fishing, wildlife capture, or plant collection;
- Use of unapproved toxic materials, including lead-based paints, asbestos, etc.
- Disturbance to anything with architectural or historical value;
- Building of fires;

- Use of firearms (except authorized security guards);
- Use of alcohol by workers.

SMEs Construction related works Management Measures

Waste Management and Erosion:

Solid, sanitation, and, hazardous wastes must be properly controlled, through the implementation of the following measures:

Waste Management:

- Minimize the production of waste that must be treated or eliminated.
- Identify and classify the type of waste generated. If hazardous wastes (including health care wastes) are generated, proper procedures must be taken regarding their storage, collection, transportation and disposal.
- Identify and demarcate disposal areas clearly indicating the specific materials that can be deposited in each.
- Control placement of all construction waste (including earth cuts) to approved disposal sites (>300 m from rivers, streams, lakes, or wetlands).Dispose in authorized areas all of garbage, metals, used oils, and excess material generated during construction, incorporating recycling systems and the separation of materials.

Maintenance:

- Identify and demarcate equipment maintenance areas (>15m from rivers, streams, lakes or wetlands).
- Ensure that all equipment maintenance activities, including oil changes, are conducted within demarcated maintenance areas; never dispose spent oils on the ground, in water courses, drainage canals or in sewer systems.
- Identify, demarcate and enforce the use of within-site access routes to limit impact to site vegetation.
- Install and maintain an adequate drainage system to prevent erosion on the site during and after construction.

Erosion Control

- Erect erosion control barriers around perimeter of cuts, disposal pits, and roadways.
- Spray water on dirt roads, cuts, fill material and stockpiled soil to reduce wind-induced erosion, as needed.
- Maintain vehicle speeds at or below 10mph within work area at all times.

Stockpiles and Borrow Pits

- Identify and demarcate locations for stockpiles and borrow pits, ensuring that they are 15 meters away from critical areas such as steep slopes, erosion-prone soils, and areas that drain directly into sensitive water bodies.
- Limit extraction of material to approved and demarcated borrow pits.

Site Cleanup

- Establish and enforce daily site clean-up procedures, including maintenance of adequate disposal facilities for construction debris.

Safety during Construction related works

The SME's responsibilities include the protection of every person and nearby property from construction accidents. The Contractor shall be responsible for complying with all national and local safety requirements and any other measures necessary to avoid accidents, including the following:

- Carefully and clearly mark pedestrian-safe access routes.
- If school children are in the vicinity, include traffic safety personnel to direct traffic during school hours.
- Maintain supply of supplies for traffic signs (including paint, easel, sign material, etc.), road marking, and guard rails to maintain pedestrian safety during construction.
- Conduct safety training for construction workers prior to beginning work.
- Provide personal protective equipment and clothing (goggles, gloves, respirators, dust masks, hard hats, steel-toed and –shanked boots, etc.,) for construction workers and enforce their use.
- Post Material Safety Data Sheets for each chemical present on the worksite.
- Require that all workers read, or are read, all Material Safety Data Sheets. Clearly explain the risks to them and their partners, especially when pregnant or planning to start a family. Encourage workers to share the information with their physicians, when relevant.
- Ensure that the removal of asbestos-containing materials or other toxic substances be performed and disposed of by specially trained workers.
- During heavy rains or emergencies of any kind, suspend all work.
- Brace electrical and mechanical equipment to withstand seismic events during the construction.

Nuisance and dust control

To control nuisance and dust the Contractor should:

- Maintain all construction-related traffic at or below 15 mph on streets within 200 m of the site.
- Maintain all on-site vehicle speeds at or below 10 mph.
- To the extent possible, maintain noise levels associated with all machinery and equipment at or below 90 dB.
- In sensitive areas (including residential neighborhoods, hospitals, rest homes, etc.) more strict measures may need to be implemented to prevent undesirable noise levels.
- Minimize production of dust and particulate materials at all times, to avoid impacts on surrounding families and businesses, and especially to vulnerable people (children, elders).
- Phase removal of vegetation to prevent large areas from becoming exposed to wind.

- Place dust screens around construction areas, paying particular attention to areas close to housing, commercial areas, and recreational areas.
- Spray water as needed on dirt roads, cut areas and soil stockpiles or fill material.
- Apply proper measures to minimize disruptions from vibration or noise coming from construction activities.

Community Relations

To enhance adequate community relations the Contractor should:

- Following the country and EA requirements, inform the population about construction and work schedules, interruption of services, traffic detour routes and provisional bus routes, as appropriate.
- Limit construction activities at night. When necessary ensure that night work is carefully scheduled and the community is properly informed so they can take necessary measures.
- At least five days in advance of any service interruption (including water, electricity, telephone, bus routes) the community must be advised through postings at the project site, at bus stops, and in affected homes/businesses.

Chance Find Procedures for Culturally Significant Artifacts

The Contractor is responsible for familiarizing themselves with the following "Chance Finds Procedures", in case culturally valuable materials are uncovered during excavation, including:

- Stop work immediately following the discovery of any materials with possible archeological, historical, paleontological, or other cultural value, announce findings to project manager and notify relevant authorities;
- Protect artifacts as well as possible using plastic covers, and implement measures to stabilize the area, if necessary, to properly protect artifacts
- Prevent and penalize any unauthorized access to the artifacts
- Restart construction works only upon the authorization of the relevant authorities.

Environmental Supervision during SMEs Construction Related works

The bidding documents should indicate how compliance with environmental rules and design specifications would be supervised, along with the penalties for non-compliance by contractors or workers. Construction supervision requires oversight of compliance with the manual and environmental specifications by the contractor or his designated environmental supervisor. Contractors are also required to comply with national and municipal regulations governing the environment, public health and safety.

Annex VI: E&S Due Diligence Checklist

SMEs Environmental & Social Due Diligence Checklist

SME Name: _____
Location: _____
Subproject works completion date: _____

Installation /Construction Plan—*check all that apply:*

- ☐ Followed standard construction design
- ☐ GCIC management team review and approval
- ☐ SMEs subproject completed and in operation with all required facilities

E&S Considerations—check all that apply:

- ☐ Proper site selection
- ☐ Documented process to assess Environmental and Social impacts and risks of its projects
- ☐ Project site visits conducted as part of E&S screening and review
- ☐ GCIC management team reviewed E&S process
- ☐ Grievance process established and working

EPA Approval and Permit—check all that apply:

- ☐ EPA Form 1 Screening submitted
- ☐ EPA Review documented
- ☐ EIA required yes ____ no____
- ☐ If EIA required, approved and permitted

Third Party Audit E&S Specifications—check all that apply:

- ☐ Conducted by _____
- ☐ Confirms all E&S requirements completed

E&S Authorized Certification:

- ☐ Independent E&S performance reviewed and cleared
- ☐ GCIC Management team Rep approved_____

If any E&S Outstanding Issues Is There an Agreed Remedial Action Plan—list & explain:

- ☐ Required additional actions
- ☐ Any outstanding or unresolved grievances?
- ☐ Target Dates
- ☐ Management authority

Attachments

- ☐ Approved Engineering design
- ☐ Photos