

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN SUMMARY

Project Title: ELECTRICITY DISTRIBUTION SYSTEM REINFORCEMENT AND EXTENSION PROJECT

Project Number: P-GH-F00-005

Country: GHANA

Department: ONEC

Division: ONEC1

a) Brief description of the project and key environmental and social components

Ghana Energy Development Access Program (GEDAP) III project draws on the on-going GEDAP which has been supported by the Bank and many other donors since 2007. The current project involves three components that will be financed by the Bank. These proposed project components include: (A) Distribution System Reinforcement and Extension (B) Off-grid Renewable Energy Electrification (C) Institutional Development and Capacity Building. The executing agency is the Electricity Company of Ghana (ECG).

The goal of GEDAP III is to improve the Ghanaian population's access to reliable and quality electricity services by extending and reinforcing ECG's distribution system and deploying off-grid renewable energy systems (solar Photo-Voltaic (PV) systems) to isolated communities where connection to the grid is not economically viable. The specific objectives of GEDAP III are to: (i) Improve system reliability and quality of service (ii) Reduce technical losses (iii) Equip ECG with modern tools to improve customer service delivery and commercial operations.

The project does not include investments in the expansion of the power generation capacity or the transmission system, but instead addresses the current distribution system constraints through technical, commercial and institutional improvements to make use of the existing capacity more efficiently.

Component A will involve (i) the construction of two Bulk Supply Point substations in Kasoa and Juabeso to serve the greater Accra and the Western Region, respectively (ii) the construction of one switching station at Asankragwa to serve the Western Region (iii) the reinforcement of ECG's distribution network in Ashanti East and West Region by providing transformers and low voltage distribution wiring (iv) grid intensification by reinforcing the existing distribution system and extending the system to cover un-electrified portions of the peri-urban or rural communities in the Kasoa, Juabeso, Asankragwa and Volta River area. The construction activities related to this component are likely to generate site specific environmental impacts.

Component B will involve the procurement, supply and installation of solar photovoltaic (PV) systems for sixty (60) targeted isolated island or lakeside communities around the Volta Lake. Activities under this component include (i) the electrification of 30 health centers and 30 schools; (ii) the installation of solar home systems benefiting 180 public officials and their families; (iii) the provision of community energy service centres (for battery and cell phone charging) as well as community public lighting. Off-grid renewable energy systems are an intrinsic part of the national energy strategy, designed to achieve universal access to electricity by 2016. As part of strategies to improve access to electricity, off-grid solar photovoltaic (PV) solution has been proposed to deliver modern electricity services to communities on off-grid isolated islands on the Volta Lake and lakeside communities with a

population above 1,000. These communities have public facilities including schools, clinics, etc. that require basic electricity services to improve their effectiveness. This component seeks to deploy renewable energy solutions (Solar PV systems) to provide the electricity requirements in public facilities in these communities.

Component C will involve (i) institutional development through support to the implementation of the Renewable Energy Authority (REA); (ii) capacity building through the implementation of a Geographical Information System (GIS) in ECG'S network, the financing of pre-feasibility studies and trainings, and (iii) the implementation of the ESMP. This component is not expected to generate negative environmental and social impacts.

b) Major environmental and social impacts

The project was classified as Category II according to the Bank's Environmental and Social Assessment Procedures and the Bank's Initial Environmental and Social Screening Checklist. In compliance with the Bank's Environmental and Social Policy and Procedures, an Environmental and Social Management Plan (ESMP) has been prepared for the proposed project.

The Bank also established that the Implementing Agency, ECG in 2007 had developed an Environmental and Social Policy Framework for Electricity Distribution Network and an Environmental and Social Policy Framework for Captive Generation and Rural Electrification. These policy documents together with the ESMP have been used to prepare this Environmental Summary for disclosure for a period of 30 days prior to the project presentation to the Board in accordance with the Bank's procedures.

Positive Impacts

Overall, the GEDAP III investment is expected to have the following impact: (i) Reduction in distribution system losses (both technical and commercial) and improvement in end user voltage; (ii) Provision of reliable power and reduction in outages; (iii) Connection of an estimated 115,000 additional customers particularly in peri-urban and rural areas; (iv) Reduction in illegal connections and electricity theft; (v) Improvement in customer relationship management, outage management and energy accounting. Other significant positive impacts include:

Improved local socio-economy: The key economic activity in the project area is agriculture, with cocoa being the main food crop. Trade is an important activity in Kasoa because of the presence of a big market, and in Asankragwa and Juabeso districts, gold mining and wood processing are important activities. The project will thus support the productivity of existing businesses by encouraging the use of electrical machinery such as mills and electric motors (for gold and wood processing), as well as refrigerators and freezers (e.g. frozen foods shops, restaurants, and bars). A reliable electricity supply will improve products quality while lowering operational costs of businesses that are currently using the next best alternative, such as stand-alone diesel generators for large high end consumers or batteries for low end consumers.

Development of SMEs: The project will stimulate the development of additional income-generation activities via the hiring of subcontractors and a variety of general services (repair and maintenance, security, cleaning, catering). But most importantly, it is expected that an

improved and increased access to electricity will stimulate the development of small and medium enterprises in the project area. Improved access to electricity will reduce operational costs significantly and thus boost business expansion and/or multiplication.

Employment Creation: The project will contribute to the direct creation of an estimated 480 temporary jobs during construction (80 for BSP and switching substations; 100 for Ashanti distribution; 180 for grid intensification; 20 for renewable energy; 100 for GIS) activities and 98 permanent jobs during operation (18 for BSP and switching substations; 5 for Ashanti distribution; 10 for grid intensification; 60 for renewable energy; 5 for GIS). During construction, the project will also generate indirect employment through the use of vendors and contractors as well as growth in local small shops and restaurants.

Solar Photovoltaic Systems: Solar PV systems for the project are off-grid installations providing access to communities that are yet to be connected to existing networks or are in remote locations. These installations are usually for homes, clinics, schools, street lighting and for radio transmission stations. The expected social impacts of this component are: (i) the electrification of 30 health centres and 30 schools; (ii) the installation of home solar systems in 180 households; (iii) the provision of battery and cell phone services, as well as public lighting to 1,000 communities, befitting an estimated 60,000 people. As far as environmental impacts, the operation of solar systems is deemed as clean technology with no air pollution issues. The cells in the panels are made from silicon which is environmentally inert. The usual environmental concern has to do with disposal of the associated batteries. However, these are expected to be recycled locally.

The positive implications of Solar PV Systems include: (i) reduction of the emissions of greenhouse gases (mainly CO₂, NO_x) and prevention of toxic gas emissions (SO₂, particulates); (ii) absence of reclamation for degraded land; (iii) reduction of the required transmission lines of the electricity grids; and (iv) absence of negative impact on the quality of water resources. Other benefits of solar systems include (a) acceleration of the rural electrification; (b) increase of energy independence; (c) provision of significant work opportunities; (d) diversification and security of energy supply; and (e) support of the deregulation of energy markets.

Potential Negative Impacts

The anticipated negative Environmental and Social Impacts of the project is summarised below:

The major negative impacts during the pre-construction and construction phases include:

Land acquisition for substation / switching station sites and the right of way: The estimated land size required for each sub-station / switching station site ranges between 0.5 to 3 acres maximum. The sites belong to two individuals (Juabeso and Asankragwa) and the Ministry of Interior (Kasoa site). The sites identified are undeveloped land without physical structures or buildings. The project is not expected to engender physical and economic displacement of populations. However, ECG is expected to conclude the negotiations for land acquisition with the concerned institution and individuals, on a willing buyer-willing seller basis.

Land Acquisition for Wayleaves: The construction of distribution lines raises issues of the acquisition of wayleaves (Right-of-way). The width of the right-of-way (RoW) for most

electrical distribution projects (11/33 kV) is 10 meters (i.e. 5 metres on either side of the centre of pole). Once the ESIA permit is secured, the line route for the proposed project will have to be identified and surveyed by the Contractors. Usually the power lines are located within the Road Reserves, as they mainly run parallel to trunk and feeder roads connecting the beneficiary communities. At sections of the line where the road reserve cannot be utilised because the location is not suitable for pole spotting or due to encroachment on the right-of-way, suitable nearby land may have to be acquired for the line to be diverted appropriately. Such instances are unknown at the moment but may involve legal land acquisition and attendant compensation issues.

Vegetation Clearance: All vegetation within the sub-stations sites shall be cleared prior to construction. All tall trees and scrub within a distance of 5 m on either side of the centreline of the distribution line (i.e. approximately 10 m wide area) should be cut down to a height of not more than 1.25 m above ground. All tall trees outside the RoW, but of such height as could fall within 2 m of the conductors, shall also be felled. Practically, this process of “bush clearing” is done in a very selective manner so as to do minimal damage to the vegetation cover and crops.

Disruption of Utility Services: The anticipated excavation and site clearing activities during construction may cause temporary disruptions of utility services such as telecommunication, electricity, water, drainage. Such disruptions as well as noise and dust that may be associated with construction activity may be a nuisance to other facility users in the neighbourhood.

Impacts during the operational phase will include: risk of insulation oil leaks from transformers and switchgears; risk of Gas leaks from modern gas-filled switchgears (sulphur hexafluoride SF₆); impacts of noise from transformers and associated equipment; and impacts of waste generated from engineering and maintenance works.

c) Enhancement and mitigation program

It is important that the recommendations and mitigation measures are carried out according to the spirit of the ESMP developed from the environmental assessment process and in line with the AfDB and ECG Environmental and Social policies, procedures and guidelines.

Environmental enhancements are not a major consideration within the sub-station and distribution network sub-project sites. However it is noted that it is possible to create some local hard and soft landscaping such as planting of shrubs. This should be encouraged as far as practicable. Solar PV Systems on the other hand are seen to generally have benign environmental impact, generating no noise or chemical pollutants during use. It is one of the most viable renewable energy technologies for use in an urban environment. It is also an attractive option for use in scenic areas and national parks, where the avoidance of pylons and wires is a major advantage. It is therefore appropriately suited to isolated and island communities for implementation of off-grid energy solutions.

Mitigation for Land Acquisition: The determination of the line route and the acquisition of the right-of-way regarding the project shall be carried out with the various Lands (Wayleaves) legislation providing the necessary legal procedures and guidelines. The line is expected to be located within the road reserve as much as possible. Once the route of the distribution line has been established, the land lying within the RoW will be subject to the provisions of the Wayleaves laws. Currently, the regulations prohibit a number of activities in the RoW,

including mining, construction of buildings and cultivation or farming. The identification and acquisition of the RoW shall be carried out by ECG with due consultations with the communities within the project's areas of influence. The Land Policy and the various Lands (Wayleaves) legislation, and the Local Government Act, 1993, Act 462, provide the relevant legal procedures for acquiring the RoW and these shall guide the District Assembly and stakeholders concerned.

Pole Spotting – The specific sites (spots) for locating the individual posts will be determined by the Contractor, based largely on various criteria including baseline environmental information gathered during the environmental assessment and studies. After confirming the line route, the Contractor would have to carry out soil tests at every pole location (at approximately 60-100 m intervals) to ascertain the nature of the soils which would determine the type of foundation to be used for the pole footing.

Most rural electrification projects are handed over to the ECG after completion for operation and maintenance. It is, thus, noteworthy that the ECG has it as a policy that all its installations and facilities are to be in compliance with the Factories, Offices and Shops Act, 1970, Act 328. The ECG Safety Policy, 2005 outlines the various safety procedures that need to be observed and applied at the various stages in carrying out activities on the ECG networks to ensure the safety of workers, the general public as well as plant and machinery.

ECG's Environmental Management Plan prepared in 1999 and ECG's Environmental Policy Framework also prescribe procedures for dealing with various concerns arising from ECG's operations, including waste handling, EMF effects and emergency response procedures, among others. These will be relevant during the operations and maintenance phase under the control of ECG.

The Road Reservation Management Manual for Coordination is a comprehensive document developed between the various utility service providers in Ghana, i.e. ECG, Ghana Water Company, Volta River Authority, Ghana Telecom), the Road Agencies (Department of Urban Roads, Department of Feeder roads and Ghana Highway Authority) and the relevant statutory and regulatory agencies (Lands Commission, Environmental Protection Agency, Lands Valuation Board, etc) for the efficient management of road reservations for the installation of public utility services such as pipelines, cables and transmission lines. Specifically, the manual outlines procedures for the handling of disruptions of utilities and vehicular and human traffic during construction, and issues of valuation for compensation purposes.

The environmental and social impacts have been classified into those relevant to the pre-construction stage (design/ preparation stage), construction stage, operation and maintenance stage. The matrix provides details of the mitigation measures recommended for each of the identified impacts, time span of the implementation of mitigation measures, an analysis of the associated costs and the responsibility of the institution. The institutional responsibility has been specified for the purpose of the implementation and the supervision. The matrix is supplemented with a monitoring plan.

A summary of the Environmental impacts and recommended mitigation measures are provided in Table 1.

Table 1: Environmental Impacts and Recommended Mitigation Measures

Environmental Concerns	Objectives	Recommended Mitigation Measures
DESIGN		
Land Acquisition / Social Impacts	To ensure that the adverse impacts due to land acquisition are mitigated	<ol style="list-style-type: none"> 1. Acquisition of land for the two substations and switching station completed to minimize the uncertainty of people. 2. ECG to select a site that will not affect any public or private property such that no additional land is required. 3. All the payments/ entitlements are paid according to agreements with land owners.
Waste Disposal	Ensure adequate disposal options for all waste including transformer oil, residually contaminated soils and scrap metal.	<ol style="list-style-type: none"> 1. Create waste management policy and plan to identify sufficient locations for storage and reuse of transformers and recycling of breaker oils and disposal of transformer oil, residually contaminated soils and scrap metal “cradle to grave”. 2. Include in contracts for unit rates for re-measurement for disposal. 3. Designate disposal sites in the contract and cost unit disposal rates accordingly.
Contract clauses	Ensure requirements and recommendations of environmental assessment are included in the contracts.	<ol style="list-style-type: none"> 1. Include ESMP Matrix in tender documentation and make contractors responsible to implement mitigation measures by reference to ESMP in contract. 2. Include preparation of ESMP review and method statement for Waste Management plan, Health & Safety Plan and Erosion Control Plan in contract as a payment milestone(s). 3. Require environmental accident checklist and a list of controlled chemicals / substances to be included in the contractor’s work method statement and tender documentation.
CONSTRUCTION		
Hydrology And Drainage Aspects	To ensure the proper implementation of any requirements mentioned in EPA conditions of approval letter in relation to Hydrology of the project.	<ol style="list-style-type: none"> 1. Consideration of weather conditions when particular construction activities are undertaken. 2. Limitations on excavation depths in use of recharge areas for material exploitation or spoil disposal. 3. Use of landscaping as an integrated component of construction activity as an erosion control measure. 4. Minimizing the removal of vegetative cover as much as possible and providing for its restoration where construction sites have been cleared of such areas.
Orientation for Contractor and Workers	To ensure that the contractor and workers understand and have the capacity to implement the Environmental & safety requirements and mitigation measures.	<ol style="list-style-type: none"> 1. ECG environmental specialist to monitor progress of all environmental statutory and recommended obligations. 2. Conduct special briefing for managers and / or on-site training for the contractors and workers on the environmental requirement of the project. Record attendance and achievement test for contractors site agents. 3. Agreement on critical areas to be considered and necessary mitigation measures, among all parties who are involved in project activities. 4. Continuous progress review and refresher sessions to be followed.
Safety Precautions For the Workers	To ensure safety of workers	<ol style="list-style-type: none"> 1. Providing induction safety training for all staff adequate warning signs in health and safety matters, and require the workers to use the provided safety equipment. 2. Providing workers with protective hard hat and hard toe shoes.

Environmental Concerns	Objectives	Recommended Mitigation Measures
Loss of Trees and Vegetation Cover of the Areas for sub-station sites, distribution lines and Temporary Work-space	To avoid negative impacts due to removing of landmark, sentinel and specimen trees as well as green vegetation and surface cover.	<ol style="list-style-type: none"> 1. The route for the distribution line should be selected so as to prevent the loss or damage to trees. 2. Clearing of green surface vegetation cover for construction, borrow of soil for development, cutting trees and other important vegetation during construction should be minimized by careful alignment. Written technical Justification for tree felling included in tree survey. 3. At completion all debris and waste shall be removed and not burned. 4. The contractor's staff and Labor will be strictly directed not to damage any vegetation such as trees or bushes outside immediate work areas. Trees shall not be cut for fuel or works timber. 5. Land holders will be paid compensation for their standing trees in accordance with prevailing market rates. The land holders will be allowed to salvage the wood of the affected trees. 6. The contractor will plant three (3) suitable new trees outside the 10 meter corridor of the distribution line in lieu of one (1) tree removed. 7. Compensatory planting of trees/shrubs/ornamental plants (at a rate of 3:1) in line with best international practice. 8. After work completion all temporary structures, including office buildings, shelters and toilets shall be removed.
Work Camp Operation and Location (if required)	To ensure that the operation of work camps does not adversely affect the surrounding environment and residents in the area.	<ol style="list-style-type: none"> 1. Identify location of work camps in consultation with local authorities. The location shall be subject to approval by ECG. If possible, camps shall not be located near settlements or near drinking water supply intakes. 2. Cutting of trees shall not be permitted and removal of vegetation shall be minimized. 3. Water and sanitary facilities (at least pit latrines) shall be provided for employees. Worker camp and latrine sites to be backfilled upon vacation of the sites. 4. Solid waste and sewage shall be managed according to the national and local regulations. As a rule, solid waste must not be dumped, buried or burned at or near the project site, but shall be disposed of to the nearest approved landfill or site having complied with the necessary permits of local authority permission. 5. The Contractor shall organize and maintain a waste separation, collection and transport system. 6. The Contractor shall document that all liquid and solid hazardous and non-hazardous waste are separated, collected and disposed of according to the given requirements and regulations. 7. At the conclusion of the project, all debris and waste shall be removed. All temporary structures, including office buildings, shelters and toilets shall be removed. 8 Exposed areas shall be planted with suitable vegetation. 9. ECG and Construction Supervising Consultant shall inspect and report that the camp has been vacated and restored to pre-project conditions.
Exploitation, Handling, Transportation and Storage of Construction	To minimize disruption and contamination of the surroundings, minimize and or avoid adverse environmental	<ol style="list-style-type: none"> 1. Use only EPA licensed sites in order to minimize adverse environmental impacts. 2. Measures to be taken in line with any EPA license conditions, recommendations and approval to be applied to the subproject activities using the licensed source including (if any such as):

Environmental Concerns	Objectives	Recommended Mitigation Measures
materials	impacts arising out of construction material exploitation, handling, transportation and storage by using sources that comply with EPA license conditions	(i) Conditions that apply for selecting sites for material exploitation. (ii) Conditions that apply to timing and use of roads for material transport. (iii) Conditions that apply for maintenance of vehicles used in material transport or construction. (iv) Conditions that apply for selection of sites for material storage. (v) Conditions that apply for aggregate production. (vi) Conditions that apply for handling hazardous or dangerous materials such as oil, lubricants and toxic chemicals.
Construction Waste Disposal	Minimize the impacts from the disposal of construction waste.	1. Waste management plan to be submitted to the CSC and approved by GEDAP ESU one month prior to starting of works. WMP shall estimate the amounts and types of construction waste to be generated by the project. 2. Investigate whether the waste can be reused in the project or by other interested parties without any residual environmental impact. 3 Identify potential safe disposal sites close to the project, or those designated sites in the contract. 4 Investigate the environmental conditions of the disposal sites and recommendation of most suitable and safest sites. 5. Piling up of loose material should be done in segregated areas to arrest washing out of soil. Debris shall not be left where it may be carried by water to downstream flood plains, dams, lagoons or other water bodies. 6. Used oil and lubricants shall be recovered and reused or removed from the site in full compliance with the national and local regulations. 7. Oily wastes must not be burned. Disposal location to be agreed with local authorities/EPA. 8. Waste breaker insulating oil to be recycled, reconditioned, or reused at ECG's facility. 9. Machinery should be properly maintained to minimize oil spill during the construction. 10. Machinery should be maintained in a dedicated area over drip trays to avoid soil contamination from residual oil spill during maintenance. 11 Solid Waste should be disposed at an approved solid waste facility and not by open burning which is illegal and contrary to good environmental practice.
Social Impacts	To ensure minimum impacts from construction Labor force on public health.	1. Potential for spread of HIV/AIDs, vector borne and communicable diseases from Labor camps shall be avoided (worker awareness orientation and appropriate sanitation should be maintained). 2. Complaints of the people on construction nuisance / damage close to ROW to be considered, responded to promptly and documented in a grievance log. 3. Contractor should make alternative arrangements to avoid local community impacts.
Air Quality	To minimize dust effectively and avoid complaints due to the airborne particulate	CONTROL ALL DUSTY MATERIALS AT SOURCE. 1. All heavy equipment and machinery shall be fitted in full compliance with the national and local regulations. 2. Stockpiled soil and sand shall be slightly wetted before loading,

Environmental Concerns	Objectives	Recommended Mitigation Measures
	matter released to the atmosphere.	particularly in windy conditions. 3. Fuel-efficient and well-maintained haulage trucks shall be employed to minimize exhaust emissions. 4. Vehicles transporting soil, sand and other construction materials shall be covered. Limitations to speeds of such vehicles necessary.
Noise	To minimize noise increases during construction	1. All heavy equipment and machinery shall be fitted in full compliance with the national and local regulations and with effective silencing apparatus to minimize noise. 2. Heavy equipment shall be operated only in daylight hours. 3. Construction equipment, which generates excessive noise, shall be enclosed or fitted with effective silencing apparatus to minimize noise. 4. Well-maintained haulage trucks will be used with speed controls. 5. Contractor shall take adequate measures to minimize noise nuisance in the vicinity of construction sites by way of adopting available acoustic methods.
Institutional Strengthening and Capacity Building	To ensure that GEDAP & ECG officials are trained to understand and to appreciate ESMP.	Capacity building activities by GEDAP Environmental Officer.
OPERATION		
Waste disposal	Minimize improper waste disposal	Continue waste management arrangements in operational phase of all subprojects and GEDAP activities.
Compensatory tree planting	Maintain survival of trees planted	Employ local area women or youth groups to monitor and water replacement saplings and replace dead specimens as necessary.
Crops and Vegetation	Monitor impacts from maintaining tree clearance under distribution lines	Track growth of large trees.
Social Safety Impacts	Ensure no encroachments/ construction under the transformers or distribution lines.	No violation of clearance spaces.

At this stage, due to the modest scale of GEDAP III power distribution projects and by generally keeping to non-sensitive and non-critical areas the construction and operational impacts will be manageable. No insurmountable impacts are predicted providing that the ESMP is implemented to its full extent and required in the contract documents. However experience suggests that some contractors may not be familiar with this approach or may be reluctant to carry out some measures. In order that the contractors and the supervision team / Construction Supervision Consultant (CSC) are fully aware of the implications of the ESMP and to ensure compliance, it is recommended that environmental measures be costed separately in the tender documentation and that payment milestones are linked to

environmental performance, *via* the carrying out of the ESMP implementation and associated reporting.

d) Monitoring program and complementary initiatives

The Monitoring Plan was designed based on the project cycle. During the pre-construction period, the monitoring activities will focus on (i) checking the contractor's bidding documents, particularly to ensure that all necessary environmental requirements have been included; and (ii) checking that the contract documents' references to environmental mitigation measures requirements have been incorporated as part of contractor's assignment and making sure that any advance works are carried out in good time. Where detailed design is required (e.g. for power distribution lines route survey and avoidance of other resources) the inclusion and checking of designs must be carried out.

During the construction period, the monitoring activities will focus on ensuring that environmental mitigation measures are implemented, and some performance indicators will be monitored to record the Sub-projects environmental performance and to guide any remedial action to address unexpected impacts. Monitoring activities during project operation will focus on recording environmental performance and proposing remedial actions to address unexpected impacts.

A summary of the monitoring plan is provided in Table 2.

Table 2; Monitoring Plan

Monitoring Parameters	Timing	Responsibility
Audit project bidding documents to ensure ESMP is included	Prior to issue of bidding documents	GEDAP / ECG - PIU
Monitor that the selection process and final alignment selection process and its environmental compliance with ESMP	Prior to approval of contractor's detail alignment survey	GEDAP/ ECG-PIU/ Environmental staff
Monitor contractor's detail project design to ensure relevant environmental mitigation measures in ESMP have been included	Prior to approval of contractor's detail alignment survey	ECG – PIU / CSC
Monitor through implementation of detail environmental guidelines for construction works including procurement management, works and closing operation	Prior to approval of contractor's detail design	ECG – PIU / CSC
Monitor Land Acquisition process to ensure negotiations are completed satisfactorily and agreements signed	Prior to commencement of construction	ECG – PIU / CSC
Monitor Orientation of Contractor and workers training schedule/ briefings	Monthly/ Quarterly Reports On-going	
Monitor the various plans to control environmental impacts: Waste Management Plan, Materials Management Plan, Health & Safety	One month before construction commences	Contractor. Approval by CSC.

Monitoring Parameters	Timing	Responsibility
Plan, Noise & Dust Control Plan		
Monitor public concerns and social safety impacts	On-going	ECG – PIU / CSC
Monitor compensatory tree planting	On-going	ECG – PIU / CSC

e) Institutional arrangements and capacity building requirements

Prior to implementation and construction of the sub-projects, the ESMP shall be reviewed by the ECG and amended after detailed designs are complete. Such a review shall be based on re-confirmation and additional information on the assumptions made at the feasibility stage on positioning, alignment, location scale and expected operating conditions of the sub-projects. For example, in this case if there are any distribution lines or extension of the sub-station boundaries to be included, the designs may be amended and then the performance and evaluation schedules to be implemented during project construction and operation can be updated, and costs estimates can be revised.

It is recommended that before the works contract is worked out in detail and before pre-qualification of contractors that the full extent of the environmental requirements for the subproject(s) and the ESMP are included in the bidding documents. Past environmental performance of contractors and awareness of environmentally responsible procurement should also be used as indicators for prequalification of contractors.

In order to facilitate the implementation of the ESMP, during the preparation for the construction phase ECG must prescribe in the contract documents that the contractors shall co-operate with all stakeholders in the mitigation of impacts. Furthermore the contractor must be primed through the contract documentation and ready to implement all the mitigation measures. The ESMP shall then be updated on a sub-project by sub-project basis taking into consideration site specific details, final designs for sub-stations or distribution line alignment and contractor work methods. The ESMP must be reviewed by the supervision team / construction supervision consultant (CSC) and approved before any construction activity is initiated in order to take account of any subsequent changes and fine tuning of the proposals.

The Ministry of Energy and Petroleum hosts the GEDAP Secretariat. GEDAP Secretariat has an Environmental and Social Unit (ESU). GEDAP I & II had engaged an environmental specialist. ECG also has one environmental specialist. It is expected that a graduate environmental specialist will be recruited as an assistant environmentalist by ECG.

The environmental officers will need a good level of awareness and will be responsible for addressing environmental concerns for the sub-projects. The Environmental specialist will need training and resources if s/he is to effectively provide quality control and oversight for the ESMP implementation. S/he will require robust support from senior management staff members and the construction supervision consultant (CSC) if all environmental concerns for the sub-projects are to be addressed effectively.

In order to achieve good compliance with environmental assessment principles the environmental staff must be actively involved, prior to the outset of the implementation design stage, to ensure compliance with the statutory obligations under the Environmental Act. It is recommended that the project implementation unit (PIU) should liaise directly with the GEDAP ESU and the ECG environmental staff to address all environmental aspects in the

detailed design and contracting stages. ECG will also need to confirm that contractors and their suppliers have complied with all statutory requirements and have appropriate and valid licenses and permits for all powered mechanical equipment and to operate in line with local authority conditions.

The environmental staff will: (a) work in the PIU with ECG to ensure all statutory environmental submissions under the Environmental and Health & Safety Acts and other environmentally related legislation are thoroughly implemented; (b) work in the PIU with ECG to ensure all environmental requirements and mitigation measures from the environmental assessment of sub-projects are included in the contract prequalification and bidding documents; (c) work with ECG to execute any additional ESMP update requirements needed due to fine tuning of the sub-projects and that environmental performance targets are included in the contracts prior to project commencement; (d) work in PIU with ECG to ensure all environmental requirements and mitigation measures from the ESMP and environmental performance criteria are incorporated in the sub-project contracts or variations and that the ESMP is effectively implemented; (e) Work with the construction supervising consultant (CSC) and contractors to manage and monitor the implementation of the project ESMP; (f) Work with management to ensure that the Environmental and Social Policy Frameworks for GEDAP are fully applied, adequately resourced and implemented.

f) Public consultations and disclosure requirements

Consultations took place in February and March 2013 during the elaboration of the ESIA and development of the ESMP, which covers all sub-projects under the GEDAP III programme. Consultations were conducted mainly in the form of open interviews with key stakeholders, which included officials from the District ECG Offices, beneficiary districts and municipal assemblies, the Town Planning Department, the Lands Commission, the Environmental Protection Agency, and private individuals such as Chiefs and representatives from beneficiary communities as well as land and business owners.

The objectives were to inform stakeholders about GEDAP III activities, assess their views and concerns, identify environmental and social impacts associated with the programme's subprojects as well as examine the zoning status of their proposed sites. Overall, the process revealed a general enthusiasm about GEDAP III. No specific concerns were raised by stakeholders, besides the expectation that they should benefit from local employment opportunities generated by these activities.

It is expected that the public consultation process will continue through-out the implementation phase in order to accommodate stakeholders' aspirations and to orient the stakeholders positively towards the project implementation and where possible to harness co-operation over access issues in order to facilitate timely project completion. The consultations during pre-construction and construction phases have been included in the activities of the ESMP.

g) Estimated costs

The budget needed for environmental and social management is the recapitulation of the following: (i) Institutional development activities (ii) Training program, awareness (iii) implementation of sub-projects ESMPs (the costs of implementing such plans measures are

included in the budgets of sub-projects) (iv) Annual assessments. The estimated costs for the ESMP implementation are summarized in Table 3.

Table 3: Estimated Costs of ESMP Implementation

Item	Actions	Budget (US\$)	Responsibility
Land Acquisition	Payment for land take for sub-stations & access roads during construction	130,290	ECG GEDAP III/Land Commission/Land Valuation Board
Mitigation	Environmental & Social Mitigation, Right of Way acquisition for poles and transformers	115,000	ECG GEDAP III
Management ¹	Permits and Licenses fees	20,000	ECG GEDAP III
Capacity Strengthening	Community Consultation / awareness raising/ sensitization / Capacity Building for E&S aspects / Health & Safety Training of staff and community awareness	190,000	ECG GEDAP III
Monitoring	Quarterly Monitoring and Reporting	65,000	ECG GEDAP III /EPA/MESS
Institutional measures	Recruitment of additional Environmentalist at ECG to support GEDAP III projects	360,000	ECG/GEDAP III
Technical measures	Monitoring and Evaluation of project implementation and project impacts	180,000	ECG Regional and District Offices
Total²		1,080,290	

h) Implementation schedule and reporting

The overall implementation of the ESMP is ECG's responsibility. Other parties to be involved in implementing the ESMP are as follows: (i) *Contractors*: responsible for carrying out the contractual obligations, implementing all ESMP measures required to mitigate environmental impacts during construction; and (ii) *Other Government Agencies*: such as the EPA, relevant local authorities, district assembly or regional and state pollution authorities, who will be responsible for monitoring the implementation of environmental conditions and compliance with statutory requirements in their respective areas and local land use groups.

The ESMP was developed at the planning stage of the project. Predominantly secondary data and site reconnaissance were used to assess the environmental impacts. The ESMP report has provided a picture of potential environmental impacts associated with the sub-projects, and recommended suitable mitigation measures.

There are some further considerations for the planning stages such as obtaining environmental clearance for the project under Ghana's EPA. The land acquisition process for the substations and switching station should also be finalized. In addition, there are also some waste management issues for the construction and operational stage that must be addressed in the detailed design and through environmentally responsible procurement. Finally, at the detailed design stage the number of and exact locations for transformer extensions, distribution lines

¹ The estimated amount will be for the registration and permitting by EPA specifically for the selected projects targeted to AfDB

² It is estimated that the project will take several months with monthly environmental supervisor fee of \$6,000/month not included here in the budget. In addition, the specific costs of the selected activities targeted to AfDB are yet to be determined (TDB).

and solar PV Systems may change subject to detailed surveys but the impacts are likely to be broadly similar at most locations.

The establishment of the distribution lines should not be difficult and this shall be conducted as the detailed designs are worked out and to dovetail with the existing system to minimize adverse impacts and maximize benefits. Further details may be required if land is identified for any other improvements along the alignment where additional land acquisition and compensation may need to be considered.

During the commissioning phase waste disposal monitoring shall ensure that statutory requirements have been met. Monitoring activities during project operation will focus on periodic recording environmental performance and proposing remedial actions to address any unexpected impacts.

In conclusion, there are no insurmountable environmental impacts for the GEDAP III sub-projects from the environmental and socioeconomic points of view. Implementation of the ESMP is required and the environmental impacts associated with the sub-projects need to be properly mitigated and the existing institutional arrangements are available. Additional human and financial resources will be required by ECG to complete the designs and incorporate the recommendations effectively and efficiently in the contract documents, which should be linked to payment milestones.

The ESMP shall be used as a basis for an environmental compliance program and be included as an appendix to the contracts. The ESMP shall be reviewed at the detailed design stage. In addition, any subsequent conditions issued by Ghana's EPA as part of the environmental clearance will be included in the environmental compliance program. Therefore, continued monitoring of the implementation of mitigation measures, the implementation of the environmental conditions for work and environmental clearance, and monitoring of the environmental impact related to the GEDAP III sub-projects should be properly carried out and reported at least twice per year as part of the project performance reports.